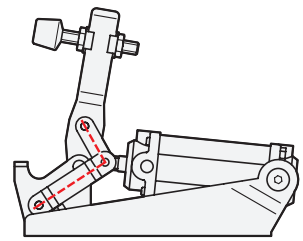
Pneumatic toggle clamps combine the advantages of clamping with the knee lever principle (clamp remains closed even after a loss of pressure) with the capabilities of pneumatic operation.

Movement phase 1

The clamping arm opens wide enough that the full surface of the workpiece is exposed, allowing it to be removed or placed into the mechanism without obstruction.

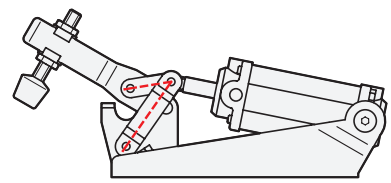


Movement phase 2

Even a slight turning of the clamping lever brings the clamping arm with the spindle assembly onto the workpiece.

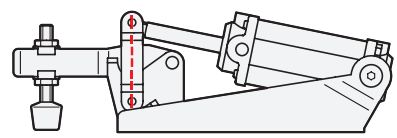
The arrangement of the three knee joints as shown makes clear that the clamping arm exerts many times the operating force on the lever.

However, the toggle clamp is not yet locked in this position; in other words, opposing forces on the clamping arm would open it again.



Movement phase 3

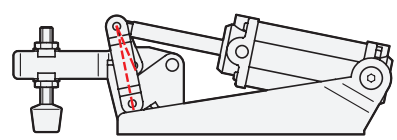
When all three joints of the knee lever are in alignment, the maximum clamping force F_S is achieved (lever dead point).



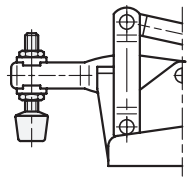
Movement phase 4

In this position, i.e. the clamping position, the lever dead point is exceeded by a specific amount and the clamping lever is fixed in place by an end stop. This ensures secure locking (self-blocking) of the toggle clamp.

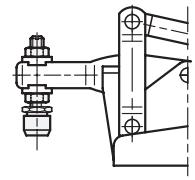
The force that can be absorbed by the clamping element in this closed state without lasting deformation is referred to as the retaining force retaining force F_H.



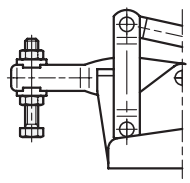
Just as with the manually operated toggle clamps, the pneumatic toggle clamps can be fitted with a wide range of clampin screws. It is also possible to attach a sensor for end position detection.



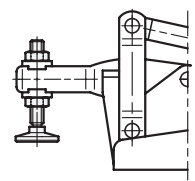
Clamping screws GN 708.1 (Page XYZ) can be adjusted for workpiece tolerances with the elastic pressure pad.



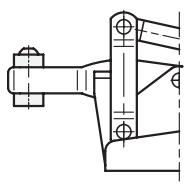
Clamping screws GN 804 (Page XYZ) with Belleville spring washers not only allow adjustment for workpiece tolerances, they also permit presetting of the respective clamping force.



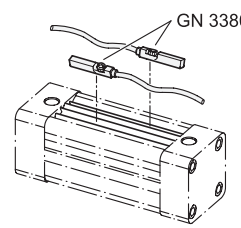
Clamping screws GN 807 (Page XYZ) are available with or without an elastic protective cap.



Clamping screws GN 903 (Page XYZ) can distribute the force more evenly on the workpiece thanks to the larger contact surface of the pressure pad.



Holders for clamping screws GN 801 (Page XYZ) are designed for toggle clamps with an open clamping arm and can be moved to any position on the clamping arm.



Toggle clamps that are equipped with a magnetic piston (coding M) allow for end position detection in connection with **sensors GN 3380** (Page XYZ) for cylinders with T-slot.