



Threaded-Body Cylinders with Locking Piston

single acting with spring return,
max. operating pressure 500 bar

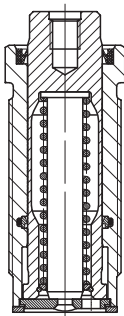


Application

Threaded-body cylinders with locking piston have a relatively little clamping force, but a high retention force in opposite direction. Therefore they are particularly suitable for clamping of thin-walled workpieces with minimum deformation as well as for "floating clamping".

Description

Threaded-body cylinders with locking piston are single-acting plunger cylinders, similar to the design of the proved threaded-body cylinders as per data sheet B 1.461. When pressurising the element, the piston will be expanded and locked in the cylinder body.



Materials

Cylinders: High alloy steel, nitrated
Piston: High alloy steel
Piston seal: NBR
Wiper: FKM
Flat sealing: POM

Important notes

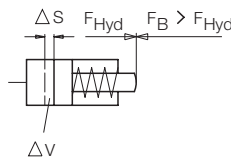
Threaded-body cylinders must not be subjected to a load in retracted position.
During installation, the tightening torque must be checked with a torque wrench.
Operating conditions, tolerances and other data see data sheet A 0.100.

Advantages

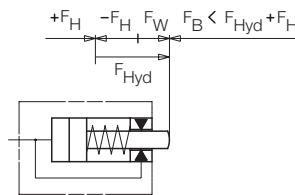
- "Clamping" and supporting" with one element
- Admissible load force up to five times the clamping force
- Clamping with minimum deformation due to relatively little clamping force, but high retention force
- Particularly suitable for "floating clamping"
- Plunger design impedes penetration of fluids into the spring area
- Clamping rows with the narrowest cylinder spacing possible
- Fixtures without tubes are possible

Function

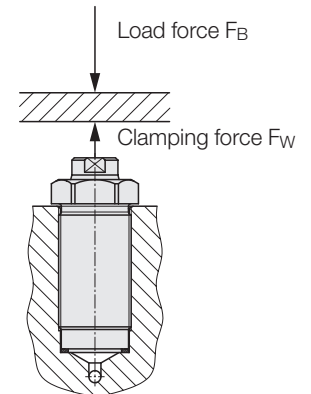
If a load force F_B higher than the hydraulic clamping force F_{Hyd} , acts on a standard clamping cylinder, the piston will be pushed back due to the compressibility of the oil.



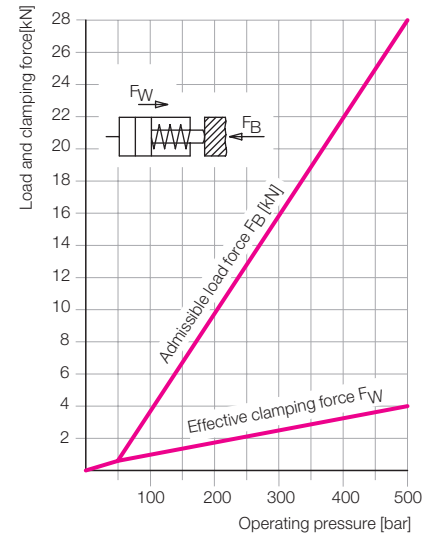
In such cases the operating pressure has to be increased or a larger clamping cylinder or additional work supports has to be used. The threaded-body cylinder with locking piston does not only clamp the workpiece, but compensates also the machining forces which are up to five times higher and are directed against the clamping force.



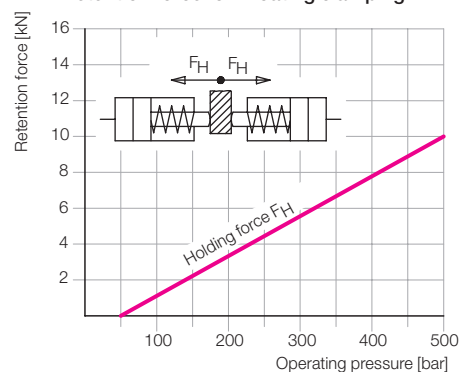
F_{Hyd} = Hydraulic clamping force
= Piston area x Oil pressure
 F_W = Effective clamping force
= $F_{Hyd} - F_H$
 F_H = Retention force, resulting from non-positive locking of the piston in the cylinder body
 F_B = Load force against the clamping force, e.g. machining forces



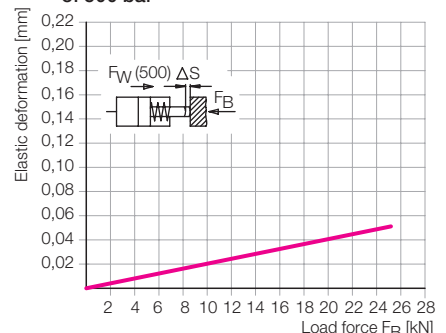
Effective clamping force and admissible load force



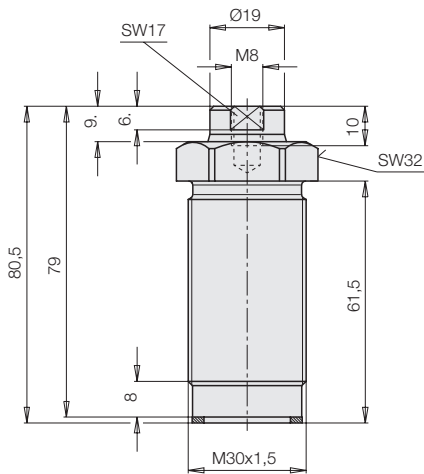
Retention force for "floating clamping"



Elastic deformation as a function of the load of the piston at an operating pressure of 500 bar



Technical data Application example

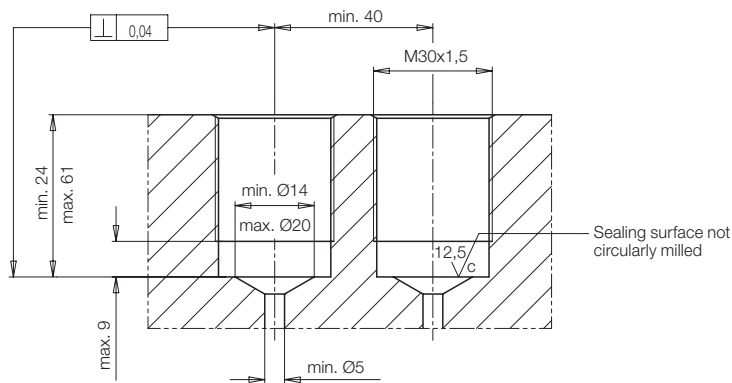


Piston Ø	[mm]	20
Stroke	[mm]	10
Oil volume per 10 mm stroke	[cm³]	3.14
Max. clamping force* at 500 bar	[kN]	approx. 4.8
Max. load force* at 500 bar	[kN]	approx. 25
Max. operating pressure	[bar]	500
Min. operating pressure	[bar]	50
Recom. pressure range	[bar]	100 ... 500
Elastic deformation*	[µm/kN]	2
Temperature range	[°C]	-10 ... +80
Tightening torque	[Nm]	60
Weight	[kg]	0.25

Part no.	1462847
Part no. spare sealing ring	3000842

* see diagram on page 1

Location hole



Application example

Simple collet for "floating clamping"

Two clamping bars with **threaded-body cylinders with locking piston** are fixed on a base plate and hydraulically connected by drilled channels. The axial block fixed in the centre is used as guide for both clamping jaws. An installed return spring moves the clamping jaws to its off-position. "Floating" clamping, i.e. the uniform and tongs-type contact at the workpiece independent of its position is possible due to the hydraulic pressure compensation between the cylinders.

Only different spring forces can influence the uniformity. After the pressure increase, the two locking pistons avoid a "further floating" of the clamping point.

