



Bore Clamp

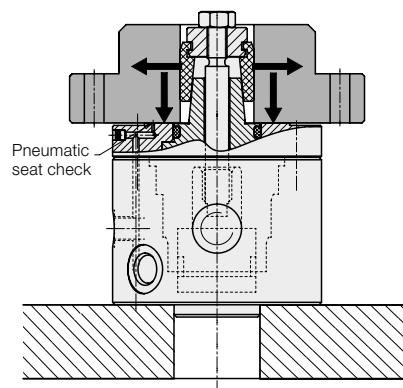
double-acting, pull-type, with and without centring function, clamping for bore diameter 16 to 46 mm, max. operating pressure from 50 up to 350 bar



Advantages

- Clamping and supporting with one element
- Compact design
- High clamping force
- Repetitive accuracy of clamping force 0.005 mm
- 5 optimised clamping ranges
- Hardened support face
- Pneumatic seat check
- Easy exchange of segment clamping bushings
- Centring at the bottom of the body
- Compensating and non-centring variants are available
- Oil supply optionnally by pipe threads or drilled channels
- Standard FKM seals
- Vulcanised segment clamping bushing

Function



Application

The bore clamp is particularly suitable for centring and clamping of workpieces with smooth machined bores ranging from 16 to 46 mm in diameter and a support surface square to the hole axis.

Description

The bore clamp is a combination of a double-acting pull-type cylinder equipped with a segment clamping bushing, which is pulled by a tie rod over a fixed cone. Thereby the segment clamping bushing expands radially to the bore diameter of the workpiece to be clamped.

By the simultaneous axial movement the workpiece is clamped onto the hardened support at the housing. The obtainable low-clamping force depends on the factor of friction within the bore and the operating pressure.

The sectioning of the complete clamping range from 16 to 46 mm in 5 sub-ranges (chart page 2) allows an optimum adaptation of tie rods, cone, workpiece support and operating pressure.

For detailed information on possible low-clamping forces and maximum operating pressures see charts and diagrams on page 2.

Important notes

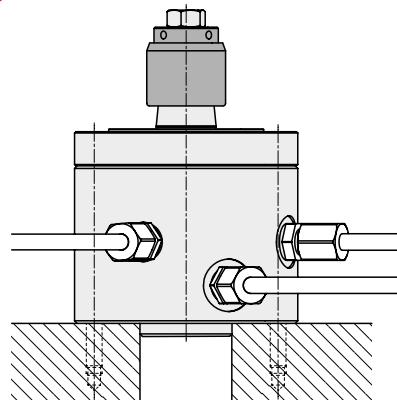
Since the segment clamping bushings are operated by a tie rod, it is imperative to consider the max. operating pressure depending on the clamping range. A too high operating pressure will destroy the tie rod.

The maximum operating pressure for the segment clamping bushing is 80°C. Avoid clamping without workpiece, if possible.

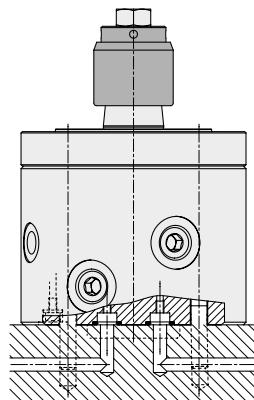
Operating conditions and other data see data sheet A 0.100.

Connecting possibilities

Pipe thread



Drilled channels



Centring function

• Bore clamp with centring

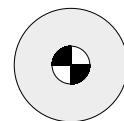
Part no.: 4317X00



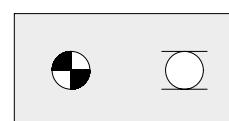
Fixed centring cone

Applications

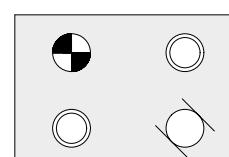
• Centre and clamp in 1 bore hole



• Centre and clamp in 2 bore holes



• Centre and clamp in more than 2 bore holes



• Bore clamp with compensation

Part no.: 4317X10



Centring cone in one axial direction
± 0.5 mm movable

• Bore clamp without centring

Part no.: 4317X20

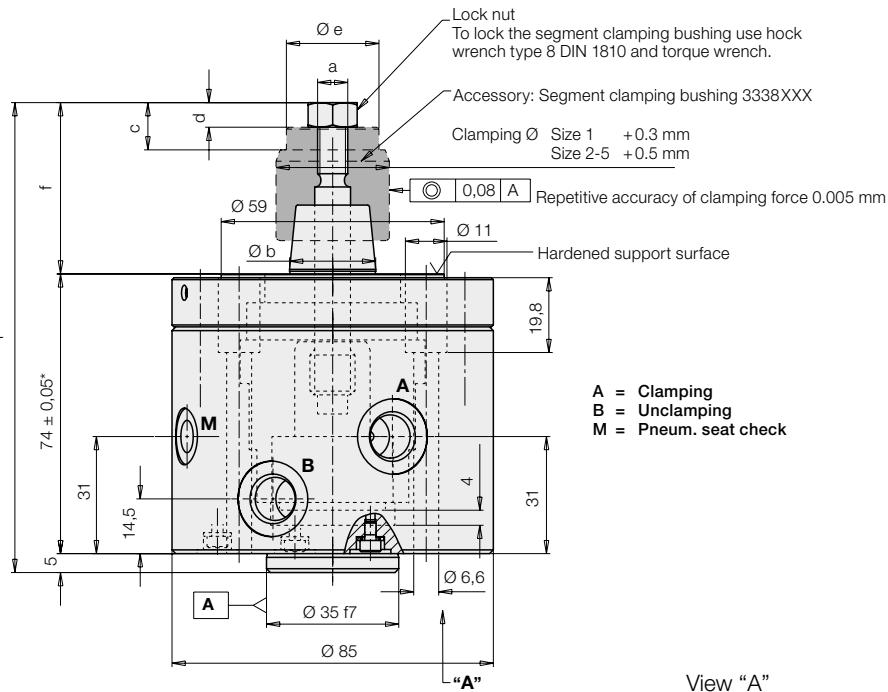


Centring cone in all directions
± 0.5 mm movable

Dimensions

Technical data

*The height can be adapted by the customer, higher precision is available on request



Material

Cylinder body

Steel

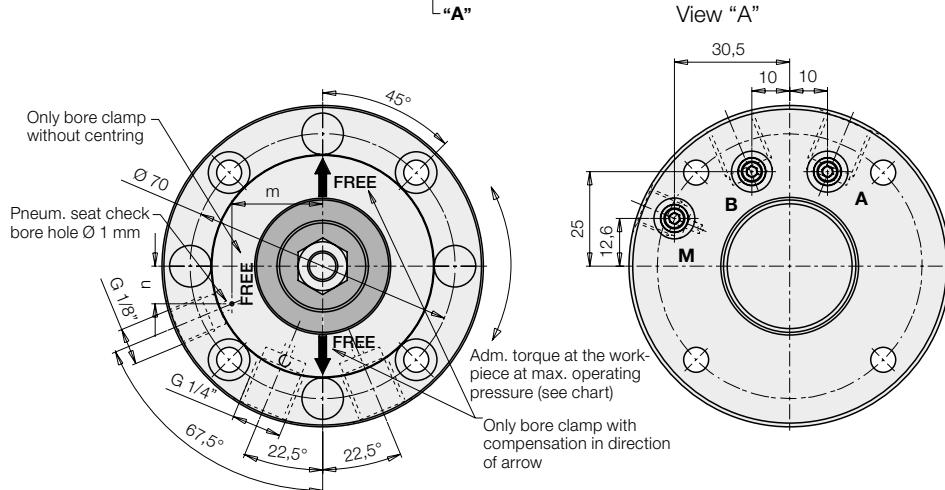
Piston, workpiece support and segment

Case-hardening steel, hardened

clamping bushing:

Note

The bore clamps are delivered without segment clamping bushings.
These can be ordered separately as accessory.

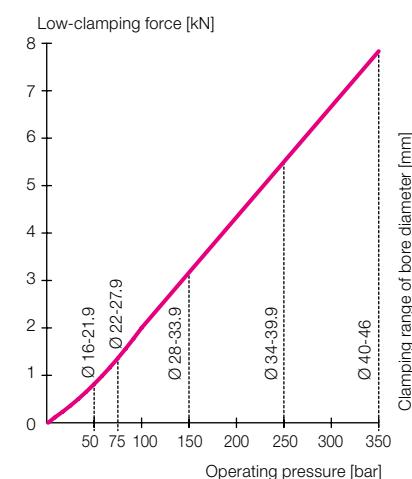


Size	(BG)	1	2	3	4	5
Clamping range Ø	[mm]	16-21.9	22-27.9	28-33.9	34-39.9	40-46
Max. low-clamping force	[kN]	0.6	1.3	3.1	5.5	7.9
Max. operating pressure	[bar]	50	75	150	250	350
Adm. torque	[Nm]	15	35	90	180	300
Max. oil volume	[cm³]	2.45/4.02	2.45/4.02	2.45/4.02	2.45/4.02	2.45/4.02
Clamping/unclamping		M5	M6	M8	M10	M12
a	[mm]	12.8	16.8	22.8	28.8	34.8
b	[mm]	8	10	12.5	15	18
c	[mm]	4	5	6.5	8	10
d	[mm]	13.5	18.5	24.5	30.5	36.5
e	[mm]	39.5	43	45.5	54	57
f	[mm]	118.5	122	124.5	133	136
l	[mm]	15	15	24	24	24
m	[mm]	6	6	10	10	10
n	[mm]	6	6	10	10	10
Seating torque	[Nm]	6	10	25	49	85
Lock nut		M5	M6	M8	M10	M12
Max. oil flow rate	[cm³/s]	20	20	20	20	20
Weight	[kg]	2.8	2.9	3	3.1	3.2
Part no.		4317100	4317200	4317300	4317400	4317500
with centring		4317110	4317210	4317310	4317410	4317510
with compensation		4317120	4317220	4317320	4317420	4317520

Low-clamping force

Material: Steel, unhardened

Surface finish: Rmax. 3 µm



Accessories

Workpiece dimensions

Accessory - segment clamping bushing

For each bore hole diameter within the clamping range the appropriate segment clamping bushing has to be selected:

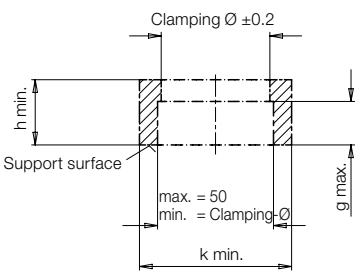
Part no. 3338XXX (clamping Ø in 0.1 mm)

Example of ordering:

Clamping Ø: **16.0** Part no. **3338160**
 Clamping Ø: **34.8** Part no. **3338348**

Workpiece dimensions and workpiece tolerance

The workpiece to be clamped should always contact the hardened support surface and cover at least in the zone of the bore hole a minimum surface of the segment clamping bushing. This is only guaranteed, if the relevant dimensions meet the requirements shown in the drawing.



Adjustment of the segment clamping bushing

Unclamp bore clamp (extended). Unscrew lock nut of the bore clamp and screw on segment clamping bushing onto the threaded rod.

Check the diameter of the segment clamping bushing by means of a vernier calliper.

The diameter of the segment clamping bushing should be adjusted to approx. 0.1 mm up to 0.2 mm less than the clamping diameter to be in the position to insert easily the workpiece to be clamped. Clamping without workpiece should be avoided due to the overexpansion of the vulcanisation.

Size	(BG)	1	2	3	4	5
Clamping range Ø	[mm]	16-21.9	22-27.9	28-33.9	34-39.9	40-46
g max.	[mm]	12	12	12	15	15
h min.	[mm]	18	18	18	24	24
k min.	[mm]	35	35	55	55	55

Workpiece tolerance

of selected clamping Ø [mm] -0.1...+0.3 -0.1...+0.5 -0.1...+0.5 -0.1...+0.5 -0.1...+0.5 -0.1...+0.5

Standard stepping 1 mm (intermediate stepping on request)

Example:

Selected clamping diameter = 16 mm

Workpiece tolerance = -0.1 up to +0.3 mm

Workpiece diameter = 15.9 up to 16.3 mm

Tightening torque for the lock nut see chart on page 2.

When tightening the lock nut to hold the segment clamping bushing without this to adjust.

Accessory for connection through drilled channels

O-ring 8x1.5	Part no. 3000343
Screw plug with collar and hexagon socket	
G1/4	Part no. 3610191
G1/8	Part no. 3610158
Alternatively, sealing plug without collar with thread sealing ring	
G1/4	Part no. 0361987
G1/8	Part no. 0361986