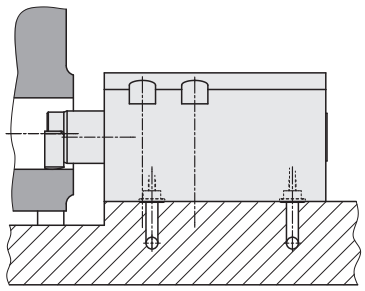
Block Clamps

without/with fail-safe function
double acting, max. operating pressure 70/100 bar

Advantages

- Fail-safe with fail-safe function
- High retention force
- Flat design
- Clamping in clamping recesses and bore holes
- Suitable for machining from 5 sides
- 2 sizes without and with fail-safe function available
- Low pressure allows direct connection to the hydraulic system of the machine
- Contact bolt interchangeable
- Clamping direction can be set between 0 and 360°
- Pipe connection or manifold-mounting connection can be selected



Fail-safe function

The full clamping force is maintained both in the event of pressure drop and a complete pressure loss. This is achieved by a fail-safe, patented clamping of the clamping bolt.

Application

Hydraulic block clamps are particularly suitable for clamping of workpieces that require a large clearance zone for machining, and for applications where conventional clamps and swing clamps are too big.
The low height of the block clamp and the ability to plunge into horizontal bores and clamp is particularly advantageous for 5-sided machining.
The block clamp with fail-safe function is used preferably on clamping pallets that will be disconnected from the pressure generator after clamping.

Important notes

Block clamps must only be used for clamping of workpieces in industrial applications and may only be operated with hydraulic oil. They generate very high forces. The workpiece, the fixture or the machine must be in the position to absorb these forces. There is a risk of crushing in the effective area of the clamping bolt.

Operating instructions

When mounting the block clamp, pay attention to careful bleeding (see page 2). The clamping bolt must effect its linear stroke to the clamping point without any impediments in order to avoid damages of the mechanics or at the workpiece.
In extended position, the clamping bolt is not secured against rotation so that the contact bolt can adapt itself to the workpiece contour.
In retracted position, the clamping bolt is rotated back again to the angle position previously set on the cover, if the deviation is less than ±8° (see also page 2).

Description

Block clamps are single and double-acting hydraulic cylinders. The clamping bolt is supported by a ball bearing and can be swivelled. During the linear extending stroke the clamping bolt with the contact bolt is moved above the clamping point and then swivelled onto the clamping point by means of a wedge drive.
The version without fail-safe function has a smooth wedge surface and requires oil pressure that is continuously available.
In the version with fail-safe function, the wedge drive is toothed to increase the friction factor. As a result, the clamping force is significantly lower, but is maintained when pressure drops.
By twisting the clamping bolt together with the rear bottom cover, every desired angle position can be adjusted (see also page 2).

Effective clamping force

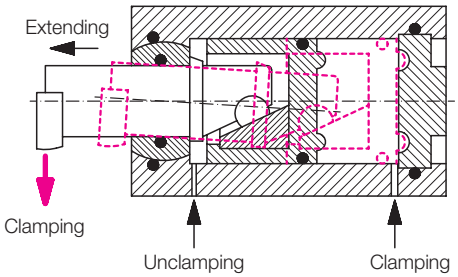
The clamping force is generated by a wedge drive and is therefore greatly dependent on the friction of the sliding surfaces. The friction coefficient is not constant over the entire service life. At the beginning, it is a little higher, i.e. the clamping force does not yet attain the set value. With increasing stroke cycles, the friction surfaces become smoother and the clamping force increases slowly. After some hundred thousand operations, the effective clamping force can exceed the nominal value by 10 to 30 % (see chart).
This characteristic of wedge drives must be taken into consideration during project planning, i.e.

1. The reduced clamping force in new condition must be sufficient to clamp the workpiece safely.
2. With increasing clamping force the workpiece must not be inadmissibly deformed.

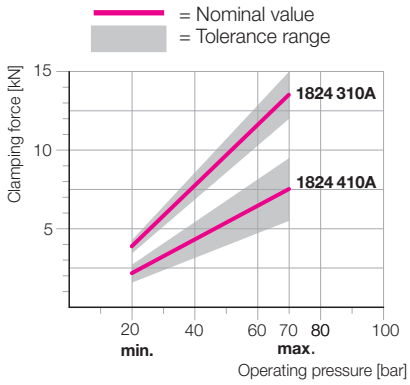
Conclusion: If a clamping force that can be reproduced exactly is required, conventional clamping elements with a direct piston drive must be used.

Position monitoring

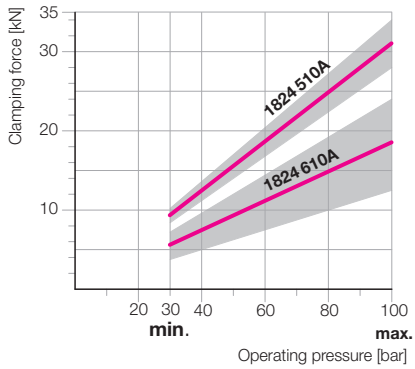
Versions with an extended piston rod at the back and pneumatic position monitoring are available on request.



Clamping force diagrams

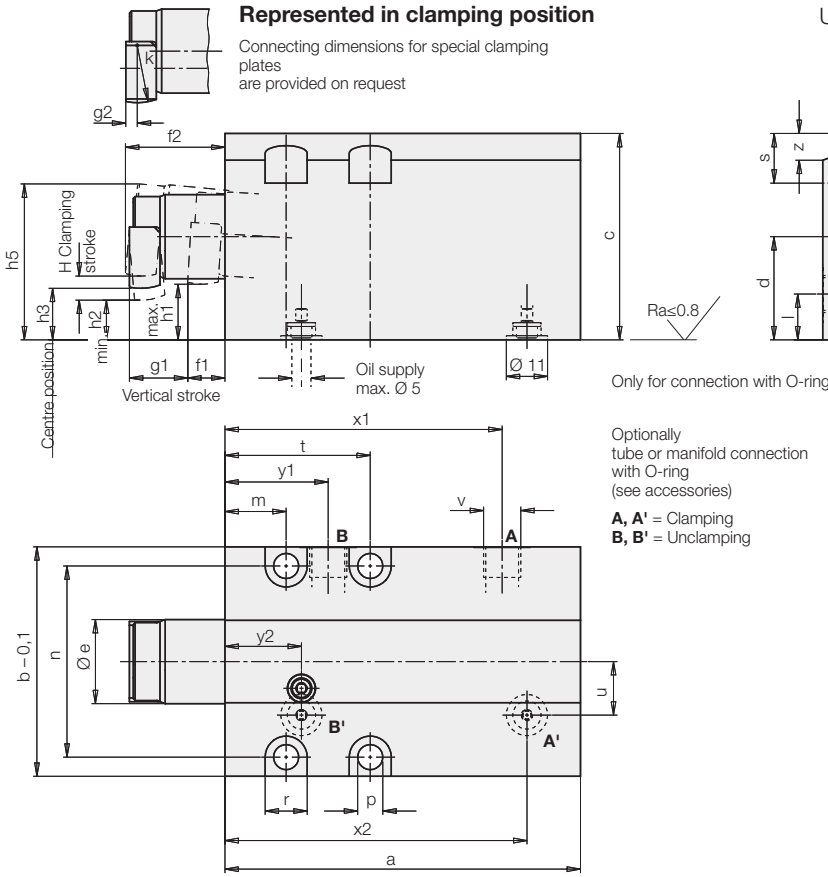


1824-310A without fail-safe function
1824-410A with fail-safe function



1824-510A without fail-safe function
1824-610A with fail-safe function

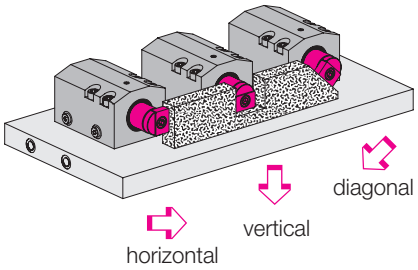
Operating conditions, tolerances and other data, see data sheet A 0.100.



Bleeding

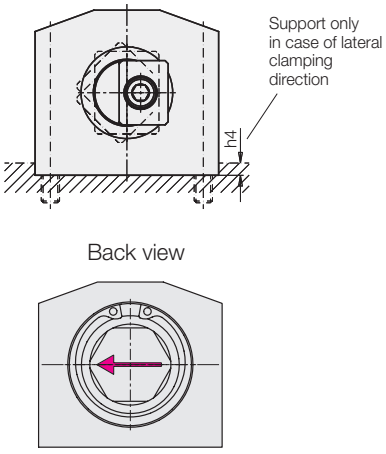
To ensure clean separation of the extending and clamping functions, the "unclamping" connection in particular must be carefully bled during commissioning. Carefully loosen the upper bleeding screw at low pressure until bubble-free oil comes out. Then tighten again and check density.

Different clamping directions



Clamping direction can be optionally in all directions vertically to the axis of the clamping lever. The clamping lever must be in its retracted position and the cylinder cover must be rotated by the corresponding angle.
When adjusting the clamping direction on the cover, make sure that the clamping direction of the contact bold points in the same direction.

Example: 90° ccw



Fail-safe function		Without	With	Without	With
Clamping force approx.*	[kN]	13.5	7.5	31	18.5
Max. operating pressure	[bar]	70	70	100	100
Min. operating pressure	[bar]	20	20	30	30
Oil volume Clamping/unclamping	[cm³]	28.9/22.8	28.9/22.8	102/76.4	102/76.4
H Clamping stroke max.	[mm]	6	6	8	8
a	[mm]	93	93	126	126
b –0.1	[mm]	60	60	88	88
c	[mm]	54	54	75	75
d	[mm]	27	27	37.5	37.5
Ø e	[mm]	22	22	35	35
f1	[mm]	10	10	13	13
f2	[mm]	26	26	40.5	40.5
g1	[mm]	15	15	26	26
g2	[mm]	3	3	3	3
h1	[mm]	14	14	19	19
h2	[mm]	11	11	15	15
h3	[mm]	13.5	13.5	18.5	18.5
h4	[mm]	4	4	6	6
h5	[mm]	41	41	60	60
i	[mm]	21	21	34	34
k	[mm]	15	15	25	25
l	[mm]	12	12	13	13
m	[mm]	16	16	21	21
n	[mm]	50	50	72	72
p	[mm]	6.6	6.6	11	11
r	[mm]	11	11	18	18
s	[mm]	13	13	20	20
t	[mm]	38	38	53	53
u	[mm]	14	14	15	15
v		G 1/8	G 1/8	G 1/4	G 1/4
x1	[mm]	72.5	72.5	99	99
x2	[mm]	79	79	108	108
y1	[mm]	27	27	37	37
y2	[mm]	20	20	28	28
z	[mm]	7	7	10	10
Part no.		**1824310A**	**1824410A**	**1824510A**	**1824610A**

* Effective clamping force see page 1

Accessories	Part no.
O-ring 8 × 1.5	**3000343**
Screw plug G 1/8	**3610047**
Screw plug G 1/4	**3300821**

Operating conditions, tolerances and other data, see data sheet A 0.100.

Subject to modifications