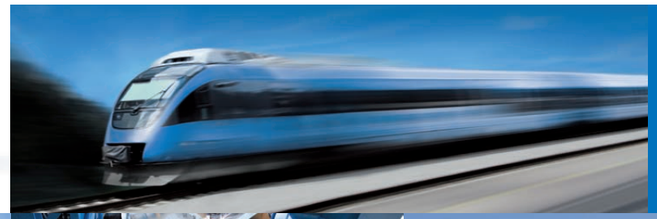
Clamping device Ratio-Clamp®

Safe and efficient fixation of round rods

HANCHEN®

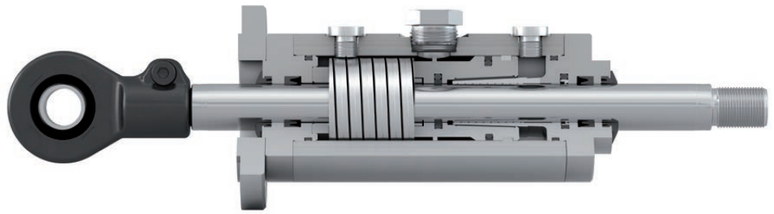
The patented clamping device Ratio-Clamp®
fixes any round rod directly from the standstill and completely locks it into position. The clamping effect is immediate, lasts for an unlimited period of time and doesn't require any energy supply – suitable for various applications, as a safety element or for locking component parts into place. 100% reliable!



Ratio-Clamp®
Won't let you down!

Contents

Safety without compromise.
Absolute efficiency.



You can find more detailed information on the clamping device Ratio-Clamp® in our book "The Hydraulic Cylinder".

Hänchen's Ratio-Clamp® offers safety while saving energy costs. Thanks to its sophisticated functional principle, the clamping device features some fundamental advantages when compared with other locking systems.

+ The functional principle in detail

Ratio-Clamp® works mechanically by using frictional contact: The power is directed through springs to a clamping sleeve which holds the rod radially using friction. The load capacity of the fixation is not influenced by the direction. The hydraulic releasing pressure moves the locking piston against the spring power to unlock the clamp - the rod can be moved in both directions. When the hydraulic pressure drops, the power stored in the springs is released, and the rod is locked.

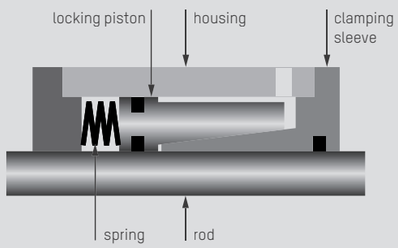
- Locks all round rods
- Clamping and releasing without axial rod movement
- Zero play and wear-free with all types of movement, even with vibrations of the application
- Energy-efficient thanks to pressureless clamping process

+ Energy efficiency and precision for every case

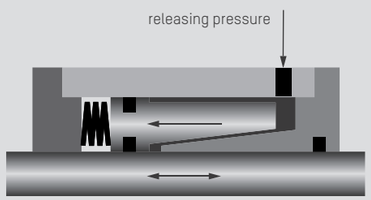
Do you need a round rod locked in a specific position? There are several ways to do this: Electronic control, blocking all ports or using the clamping device Ratio-Clamp®. Ratio-Clamp® features a number of advantages.

- Clamping without energy supply
- Cost savings thanks to no energy loss
- Safe clamping in case of system failure
- Clamping for an unlimited period of time
- Accurate locking in any position
- Safety even in extreme conditions such as heat or cold

Functional principle
Locked state

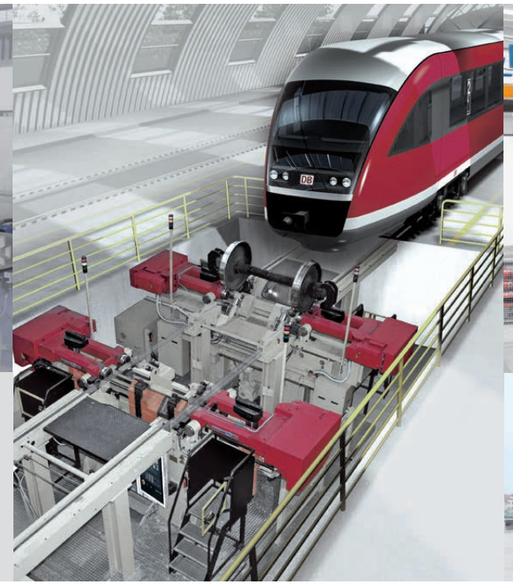


Functional principle
Released state



Comparison of advantages and disadvantages of locking options for round rods

	Electronic control	Blocking ports	Clamping device Ratio-Clamp®
Energy efficiency	–	+	+
Accuracy of position	+	–	+
Independence of external factors	+	–	+
Time and effort	–	+	+



We promise a lot.
And we keep it all.

You need assistance?
Hänchen offers extensive all-round support and service. From standard to special solutions - with decades of experience, we'll always find the perfect product for your application.

There are many situations where rods have to be held in a certain position: For example to protect people, machines and tools in case of power failures or plant shutoffs. Or to fix axes during a manufacturing process. And also for all highly dynamic applications and test processes. Here are some examples from practical experience:

1. Casting machine > Production
Hänchen cylinders and Ratio-Clamp® clamping devices are perfect for casting machines because they must be precise as well as particularly resistant to heat and corrosion. Ratio-Clamp® devices hold the mould parts safely together during the casting process of aluminium motor blocks.

2. Sanding machine > Production
During the production process of ICE track beds, extremely large and heavy concrete workpieces must be positioned for sanding safely and with an accuracy of 0.01 mm. Hänchen's hydraulic cylinders and Ratio-Clamp® clamping devices are designed exactly for these requirements.

3. Trains > Maintenance
Trains need to be lifted and fixed for maintenance – Ratio-Clamp® devices are perfect for this. The clamping device will keep the train safely in place until the work is done and it can get back on the tracks.

4. Aviation > Test stand
The setups for aviation tests have been refined to the last detail. Hänchen cylinders are used in different fields of testing, simulating ambient conditions and loads during different flight phases. Ratio-Clamp® clamping devices are used to protect the intricately constructed and expensive systems.

5. Navigation > Transport
Hänchen hydraulic cylinders with fitted Ratio-Clamp® devices are used for moving the bow and stern doors of ferries. The clamping devices guarantee that the doors are tightly closed during the voyage and safely locked while passengers are embarking or disembarking.

Releasing pressure

+ Basic design

The basic release pressure required for releasing the clamping device is between the minimum pressure and the maximum admissible pressure of 160 bar.

+ Reduced design

For application cases with low supply pressure, a version designed with a reduced released pressure is available.

Locking

+ With spring power

Usually, energy stored in springs is used to clamp a rod. This means that the rod can be held for unlimited periods of time without any energy supply.

+ Hydraulic

When very high holding loads are required, the clamping device can also be locked hydraulically. For the release, hydraulic pressure is used as usual.

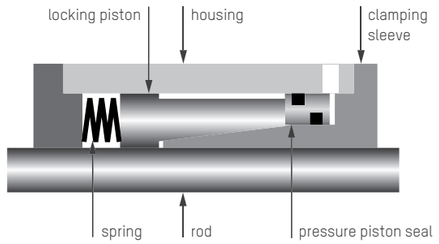
Sealing system

+ Servocop®: compact seal, lip seal, wiper ring

The basic type of Ratio-Clamp® uses the friction-optimized sealing system Servocop®. Here, the primary seal is touching the rod. The maximum speed of the rod is 1 m/s.

+ Pressure piston seal, lip seal, wiper ring

For very sensitive applications, we recommend the design with pressure piston seal, where no pressurized seal is touching the rod. Thus, the sliding friction is very low and remains constant regardless of the releasing pressure. The maximum speed of the rod is 2 m/s.



Certification

+ TÜV certification

Ratio-Clamp® is certified by TÜV SÜD as a safety element.

+ DGUV Test

The clamping device is also available with a DGUV Test certification (testing and certification system of the Deutsche Gesetzliche Unfallversicherung).

Quality taken to the next level.

+ hydraulic cylinders

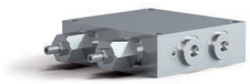
Ratio-Clamp® can be combined with Hänchen hydraulic and standard cylinders and with all cylinders from other manufacturers.

+ Proximity switch

Indicates whether the clamping device is locked released.

+ Control block

Used when Ratio-Clamp® is installed on a cylinder. It provides correct and consistent control and thus reduces the complexity of the required wiring.



+ Technical data

- For all round rods with hard surfaces
- Load capacity independent of direction
- After 2 m switchings, the clamping device must be checked by the manufacturer
- Max. rod speed: 1 m/s for Servocop®, 2 m/s for pressure piston seal
- Max. releasing pressure: 160 bar
- Operating temperature: -15 to +80° C
- Fluids: mineral oils, other fluids such as HFC or Skydrol® on request

	Ratio-Clamp®		Ratio-Clamp® with reduced releasing pressure		Ratio-Clamp® with DGUV Test certification		Ratio-Clamp® with pressure piston seal	
+ **Sealing system**	Servocop®		Servocop®		Servocop®		Pressure piston seal	
+ **Releasing pressure**	Basic design		Reduced design		Basic design		Basic design	
+ **Certification**	TÜV certification		TÜV certification		DGUV Test		TÜV certification	
+ **Locking**	With spring power		With spring power		With spring power		With spring power	
Rod Ø f7 in [mm]	F axial max in [kN]	p release min in [bar]	F axial max in [kN]	p release min in [bar]	F axial max in [kN]	p release min in [bar]	F axial max in [kN]	p release min in [bar]
16	10	60	8	50				
18	12.5	55	8	35	6.25	55	12.5	75
20	14	55	9	40	7	55	14	75
22	17	70	12	45	8.5	70	17	90
25	20	70	15	50	10	70	20	90
28	31.5	90	25	65	15.75	90	31.5	120
30	40	105	30	75	20	105	40	135
32	40	60	30	45	20	60	40	90
36	45	75	32	50	22.5	75	45	100
40	50	80	38	55	25	80	50	100
45	65	70	45	50	32.5	70	65	90
50	80	90	55	60	40	90	80	110
56	90	75	60	50	45	75	90	100
60	100	75	70	55	50	75	100	100
63	100	85	60	55	50	85	100	110
70	140	80	100	55	70	80	140	110
80	180	90	130	65	90	90	180	110
90	200	65			100	65	200	85
100	250	75			125	75	250	95
110	300	65			150	65	300	90
120	330	70			165	70	330	90
125	350	75			175	75	350	90
140	450	65			225	65		
160	750	90						

Other holding loads & rod Ø on request
Hydraulic locking up to 2,000 kN & rod Ø 300 mm

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HÄKO

You can find design and calculation assistants in our product configurator at www.haenchen-hydraulic.com

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HH 2513 / 06-2015