



**HANCHEN**<sup>®</sup>

**HYDRAULIC-CYLINDERS**  
**RATIO-CLAMP<sup>®</sup>**

Clamping device



*... simply good.*

## Grabs and clamps for all it's worth...

At the very latest when, because of a power failure (intentional or not) or a malfunction something has to be done to safeguard man and machine, Ratio-Clamp® from Hänchen is just what you need.

It grabs and fixes the piston rod in place wherever it is at that particular moment. Without having to rustle up some extra power (no extra energy) and for as long as it takes to rectify the

breakdown. Ratio-Clamp®

has been approved by the German Technical Inspection Agency (TÜV). Nor

does the development of

specific solutions (larger rod diameters, intermediate sizes, greater clamping forces...) pose a problem to the Hänchen specialists.

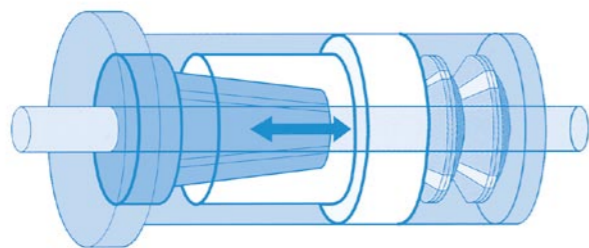


Machining of a roadway element for an ICE railway track: 9 tonnes of concrete precisely clamped.

## Stop and go! Operating principle – a patented matter

The patented functional principle provides guaranteed protection of man and machine. As long as the unlocking pressure is active, each rod can be freely moved in both directions. The force stored in springs is released and clamps the bar as soon as the unlocking pressure is removed. This can be caused by an intended pressure reduction or a pressure drop in the hydraulic system as a result of an emergency

switch-off, power failure or system damage. Over an unlimited period of time and without any additional energy supply, clamping will be maintained until it is opened by the unlocking pressure, and the free movement of the piston rod is restored.



## Advantages:

- High operational safety
- Immediate fastening of the piston rod
- Tested by the German Technical Inspection Agency (TÜV)
- For small and large bar diameters from 10 to 140 mm and more
- For small to extremely high holding forces ranging from 1.0 to 450 kN and more
- Activated in case of power failure
- Unlimited clamping duration without additional energy supply
- No slippage or play after clamping, as the clamping sleeve is axially fixed
- Display of the lock status
- No damage to the clamping unit or the clamped bar during sporadic slip-through or overload
- Maximum holding forces with minimum design
- Almost free of wear
- Low-cost special solutions possible

## The program – user oriented

Hänchen has geared its tried-and-tested Ratio-Clamp® clamping unit range of products to users, who have until now had to undertake clamping with their own designs or customised solutions. As Ratio-Clamp® and the clamping, flange and intermediate flange components are available individually, the TÜV-approved system does not only ideally match the Hänchen cylinder, but it can also be used for many other applications. The installation dimensions and technical data can be accepted quickly without any fuss by the designer from the Hänchen electronic – catalogue "E-Kat".

A multifaceted catalogue range of clamping unit products with a clamping force of between 1 and 450 kN and for rod diameters of 10 to 140 mm (other dimensions on request) covers further application areas without customised designs. Ratio-Clamp® enables safeguards to be established for employees and systems where control breakdowns and malfunctions in production occur, similar to that found in foundries, in mould building and press construction.

Hänchen Ratio-Clamp® works particularly effectively in:

- Plastic injection-moulding machines
- Metal pressure die-casting machines
- Aluminium smelting furnaces
- Aircraft towing tractors
- Shock absorber and tyre testing systems
- Electrical discharge machines
- Assembly facilities of various kinds
- Machine tools
- Ship propulsion drives
- Honing machines
- Welding robots
- Presses and much more.





### Showing what's going on

In order to display whether the clamping unit is locked or not it is advisable to install an inductive proximity sensor. The proximity sensor operates without making contact and is thus free of wear-and-tear.



### A true fit: mounting kits and flanges

Various fastening parts can be mounted to a standard **Ratio-Clamp®**. Or you may receive them already mounted on a Hänchen cylinder. In the event that you should wish to mount the **Ratio-Clamp®** to an existing cylinder, we will require the exact dimensions of any other make of cylinder.

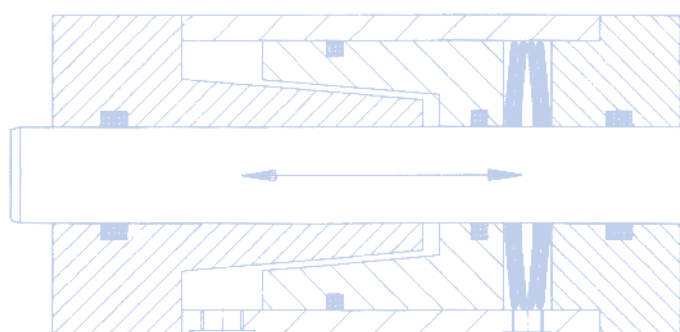


### Where to next? The control block

When using a safety clamp on hydraulic cylinders the use of Hänchen control blocks has proven to be practical. They provide a safeguard after the subsequent operational sequence and also reduce the switching technology expenditure for the user to a minimum.

### You have to know how

You can find a wide variety of designs with matching plug connectors and the installation dimensions for them, the mounting dimensions resulting from different cylinder designs without forgetting the control blocks in the E-Kat from Hänchen.



## Smaller is also possible - that's where the new Ratio-Clamp® bar clamping unit in mini format comes in handy.



### Don't waste a thing

Or would you use a wind tunnel to blow out a candle? Now at last there is a small-sized solution that holds piston rods and other rods or bars - for the sake of safety and also in favour of precision. With this product, Hänchen has extended its Ratio-Clamp® program toward the low-end: as a plug-and-play module with or without piston rod.

Let the air out of your design and put in more space because the new **Ratio-Clamp®** is barely larger than a cigarette box. This is advantageous wherever it is completely sufficient to hold 10 or 12 mm bars and wherever small forces of up to 1.0 or 1.2 kN are entirely sufficient. You don't need more and anything else would be a waste of space and energy.

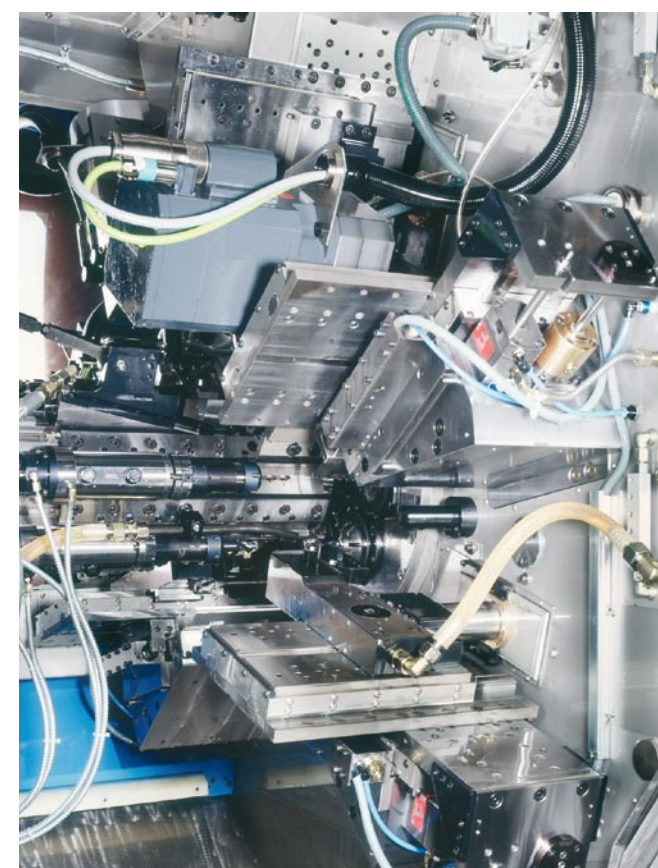
### A true rival for pneumatic systems

The new compact clamping systems also profit from this technology. Because their use offers the typical advantages of a hydraulic system: a high power density and precise reactions on account of the minimum compressibility of the medium. And the **small Ratio-Clamp®** is in a comparable price class with pneumatic clamping systems of the same output. It

is the first choice for all application in which a hydraulic power supply is already in place. It allows especially the construction space to be significantly reduced and a clamping unit to be mounted into existing constructions in which this has previously been impossible for reasons of space. And finally, the technical designer can replace a heavy clamping system by several smaller one thanks to the new size and low costs. This permits greater precision in fixation through additional supporting points. Since the new series is designed as a standalone system, its installation is very simple.

### From our versatile applications:

- Positioning of axles
- Clamping without energy demand
- Continuous clamping of loads
- For blocking of piston rods
- Safety device for protection of expensive tools at power failure
- For exact fixation of variable stops in machining centers
- For protection of opened molds



Fixing a positioning axis in a machine tool



## Ratio-Clamp® type RC-H – A New Safety Model

For use, for example, in hydraulic presses and in injection moulding machines, the Ratio-Clamp® type RC-H is available.

This clamping device meets the requirements of the Health and Safety Section of the Employers' Liability Association (BGZ iron and metal section III, Düsseldorf).

- The holding forces are at least twice the weight of the load to be carried (see chart).
- The locked status is sensed by an inductive proximity sensor and displayed. The sensor operates without making contact and is thus practically free from wear and tear.

- The proximity sensor is equipped with an additional diagnosis output to enable it to monitor its own functions.
- The clamping unit is intended to be used to lock during a machine downtime.



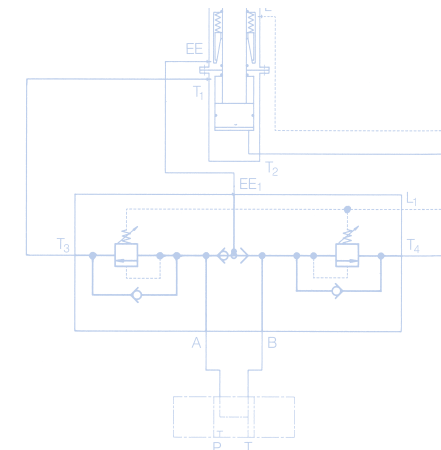
Federal German law (BG) requires that the user ensures that the **Ratio-Clamp® RC-H** clamping unit model is installed in compliance with the requirements prEN 693 or DIN EN 201 and that control technology measures are taken, which will prevent the clamping unit from releasing prematurely (before the load is supported on the pressure column) and which

implement a solution through which the holding force can be inspected when in installed status. This is the somewhat down-to-earth requirement. Next to the providing the user with the catalogue range of products we at Hänchen are only too glad to offer our know how and experience with regard to clamping units in their planning and configuration.

## Technical data

- The **Ratio Clamp®** enables each rod with a hard surface (e.g. chrome plated  $\geq 48$  HRC) to be locked using the f7 ( $R_z < 2.5 \mu\text{m}$ ).
- Maximum rod speed, 1 m/s.
- Maximum permissible release pressure, 160 bar.
- Operating temperature,  $-25^\circ \dots +70^\circ \text{C}$ .
- Media: mineral hydraulic fluid with a viscosity of 22 to 68 cSt at  $+40^\circ \text{C}$ .
- We recommend checking the clamping forces after 2 million load changes.

The range of standard products now covers rod diameters from 10 mm to 140 mm, diameters up to 180 mm are also possible as special constructions with the patented technology. These hold forces of up to more than 900 kN. With other technologies, Hänchen can offer holding devices for rods up to a diameter of 300 mm, corresponding to a clamping force of 2,000 kN!



Rod Ø* f7 [mm]	Type RC						Type RC-H		
	F axial load max. [kN]	p Release-pressure minimum [bar]	p Release-pressure maximum [bar]	F axial load max. [kN]	p Release-pressure minimum [bar]	p Release-pressure maximum [bar]	F axial load max. [kN]	p Release-pressure minimum [bar]	p Release-pressure maximum [bar]
10	1	125	160						
12	1.2	140	160						
16	10	60	160	8	50	160			
18	12.5	55	160	8	35	160	6.25	55	160
20	14	55	160	9	40	160	7	55	160
22	17	70	160	12	45	160	8.5	70	160
25	20	70	160	15	50	160	10	70	160
28	31.5	90	160	25	65	160	15.75	90	160
30	40	110	160	30	75	160	20	105	160
32	40	60	160	30	45	160	20	60	160
36	45	75	160	32	50	160	22.5	75	160
40	50	80	160	38	55	160	25	80	160
45	65	70	160	45	50	160	32.5	70	160
50	80	90	160	55	60	160	40	90	160
56	90	75	160	60	50	160	45	75	160
60	100	75	160	70	55	160	50	75	160
63	100	85	160	60	55	160	50	85	160
70	140	80	160	100	55	160	70	80	160
80	180	90	160	130	65	160	90	90	160
90	200	65	160				100	65	160
100	250	75	160				125	75	160
110	300	65	160				150	65	160
120	330	70	160				165	70	160
125	350	75	160				175	75	160
140	450	65	160				225	65	160

\* other dimensions on request

## Ratio-Drive® – the Hänchen system solutions that are tailored-made for individual applications

Do you want to achieve specific movements and speed profiles, or to move to any given position extremely precisely and reproducibly? Ratio-Drive® from Hänchen provides you with the ready-to-use solution for such situations – plug-and-play. Ratio Drive® is a self-contained, high-performance, safe and reliable linear drive for practi-

cally any application area. It is a combination of „standardised“ components and relevant mechatronic services ranging from design, project planning, software consulting and integration into a superordinate control system right through to on-site commissioning.

## Why search endlessly? The E-Kat from Hänchen contains the whole range

You need the perfect hydraulic linear drive solution, or absorbers? You require hydraulic cylinders in general mechanical engineering and special mechanical engineering or test cylinders for the simulation of real situations? In the electronic catalogue from Hänchen you will find all you need.

From individual cylinder components (normalised parts and Hänchen standards), the clamping unit Ratio-Clamp®, absorber elements and industrial shock absorbers, electronic components, proximity sensors and matching connectors as well as attachment/mounting parts to the final bolt, here you will find all components your customised solution comprises. **For your safety: all parts have undergone quality and functional tests and match perfectly.**



**HÄNCHEN®**

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*simply good.*