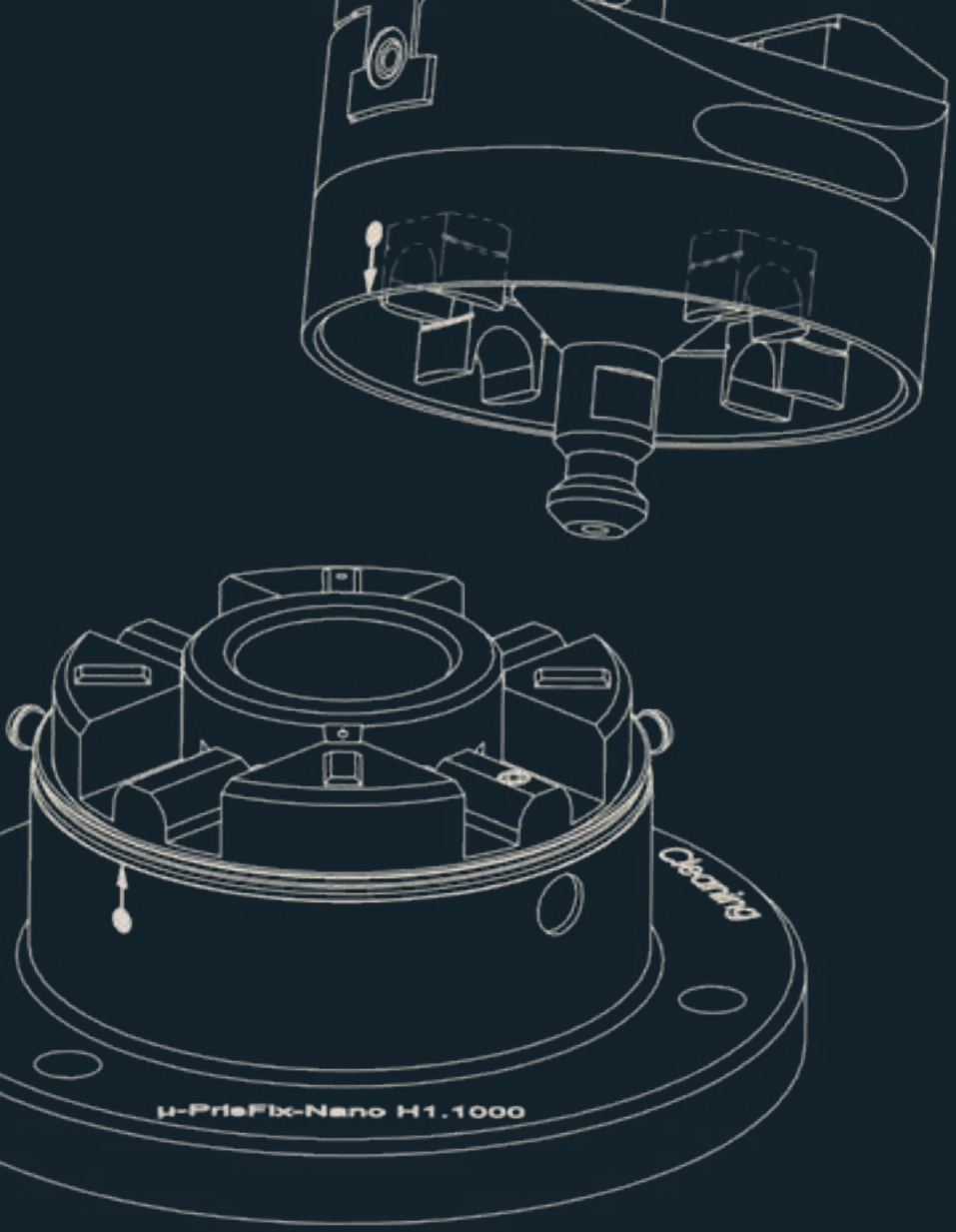

the **precision** benchmark

Clamping System µ-PrisFix-Nano

High precision part production

CARL HIRSCH MANN

EN2610

Carl Hirschmann GmbH

Carl Hirschmann – the precision benchmark

Our Clamping System µ-PrisFix-Nano with a repetitive accuracy of ≤ 0,1 µm and a changing accuracy of ≤ 0,5 µm is the measure of all things in precision – designed for metal cutting manufacturing (turning, milling and grinding) and non-cutting machining (EDM and laser machining) or measuring technology. Already our standard assortment covers a wide range. For your specific requirements we design and produce individual configurated palletiz-ing and clamping systems up to assembling in the metal-cutting machine.

The tight cooperation with the customer guarantees perfect results even for complex challenges.

Take benefit of our full service out of one source. Our Clamping System µ-PrisFix-Nano offers you unbeatable advantages on global market.

Precision as passion

Highest precision is the distinctive trademark of our clamping systems. With great passion and deep special know how we develop and manufacture trend-setting products for your ambitious requirements – since decades and with increasing enthusiasm. As leading manufacturer in clamping technology for EDM, milling, turning and measuring machines as well as for machining centers we convince with competence in solutions and innovative conceptional results. We are the system provider with perfected engineering for clamping projects.

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General information

Operation

Most tools are supplied together with an operating guide. Correct operation cannot be ensured and danger to personnel and machine cannot be excluded unless these operating instructions or information given in this catalogue are observed.

Precision

The individual tool planes incorporate hardened and precision ground X and Y centering prisms and separate Z-supports.

Service and maintenance

Since the Clamping System is subject to chemical and physical influences, maintenance and service has to be performed with special care.

Technical modification

All products shown in this catalogue are subject to ongoing improvements and developments; we reserve the right to make modifications without notice.

Quality according to ISO 9001 and EN 9100

All products of Carl Hirschmann GmbH are manufactured using the latest production methods. All products are submitted for ISO 9001 and EN 9100 (air and space industry standard) quality assurance.

Warranty

We provide a 12 month warranty for all Clamping System parts starting from the invoice date, and assuming correct use and maintenance as specified has been observed.
The warranty is restricted to replacement or repair, free of charge, of any defective parts. Claims arising from improper use or handling shall not be considered. Warranty claims must be submitted in writing.

Clamping System µ-PrisFix-Nano

Precision in the process chain

The repeatability of positioning in the process chain is a main criterion for the selection of a clamping system. The **repetitive accuracy** (same pallet on same clamper) in standard clampingsystems is around 2 µm. But the **changing accuracy** (same pallet on different clampers) is 8-15 µm.

When using standard clamping systems the maximum allowed manufacturing tolerance in the process chain (from Machine to (measuring) Machine) has already been reached or exceeded at re-clamping without having a manufacturing failure.

Although this is sufficient for many manufacturing processes it is not acceptable in the manufacturing of high precision small parts.

This requires manufacturing tolerances of <5 µm. The high precision Carl Hirschmann Clampig System µ-PrisFix-Nano guarantees a **repetitive accuracy** of **≤ 0,1 µm** and a **changing accuracy** (clamper to clamper) of **≤ 0,5 µm*.**

*The repetitive and changing accuracies were checked and confirmed by the Federal Institute of Technical Physics (PTB) as a part of a development project. Test results are available upon request.

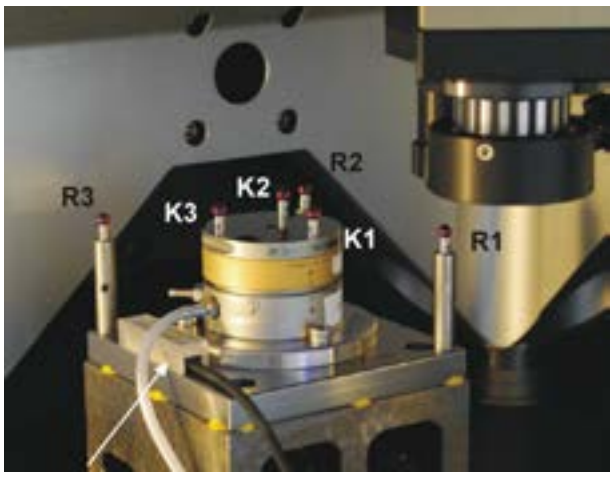
Definition repetitive accuracy / changing accuracy

Repetitive accuracy

Is the positioning accuracy of a pallet (sliding, twisting resp. tipping) when clamped repeatedly in the same clamper.

Changing accuracy

Is the positioning accuracy of a pallet (sliding, twisting resp. tipping) when clamped between different clampers.



Test assembly

Zeiss measuring machine F25

What‘s left of my allowable design tolerance?

Design tolerance data of <10 µm are not uncommon in the manufacturing of small parts. If the part can be produced in one set-up and the machine meets the accuracy tolerance this is not a challenge.

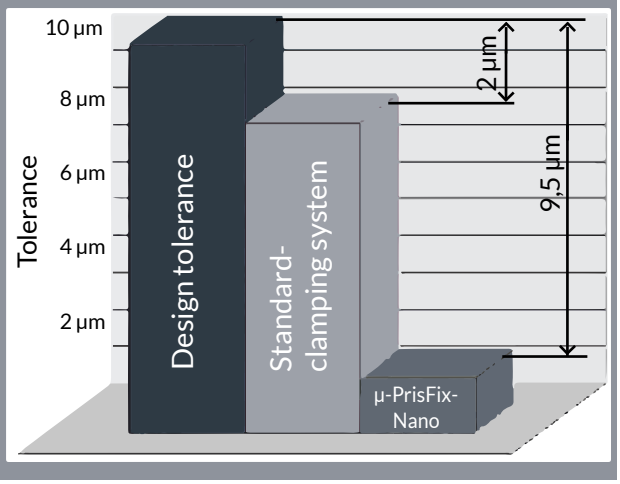
However if the workpiece has to be manufactured in a process chain using standard clamping systems (changing accuracy 8 - 15 µm, using different set-ups and machines, the allowable tolerance is quickly depleted.

In this case the solution is the use of the high precision Carl Hirschmann Clamping System µ-Pris-Fix-Nano with an average changing accuracy of **≤ 0.5 µm**.

Example

Using a design tolerance of 10 µm and a changing accuracy of the clamping system of 8 µm, **80 %** of the design tolerance is used up from the clamping system. The allowable design tolerance is quickly exceeded if there are errors in the machine, the tools, set-up or measurement errors.

With the Carl Hirschmann Clamping System µ-PrisFix-Nano with a guaranteed **average changing** accuracy of **≤ 0.5 µm**, there is a 9.5 µm tolerance left for the manufacturing. The **loss of tolerance** is only **5 %**.



	Standard clamping system	µ-PrisFix-Nano
Drawing tolerance	10 µm	10 µm
Changing accuracy	8 µm	0.5 µm
Tolerance left	2 µm	9.5 µm
Tolerance loss	**80 %**	**5 %**

Clamping System µ-PrisFix-Nano

For high precision small parts manufacturing

The complete rust-resistant Clamping System µ-PrisFix-Nano is a high precision mini clamping system for use in the manufacturing of small parts. The average changing accuracy in the process chain (change over accuracy) of ≤ 0.5 µm (0.000019“) warranted stable and repeatable production processes.

The patented Reference System will be used on machine tools (milling, drilling, grinding, erosion, laser machines and so on) and in measuring technique.

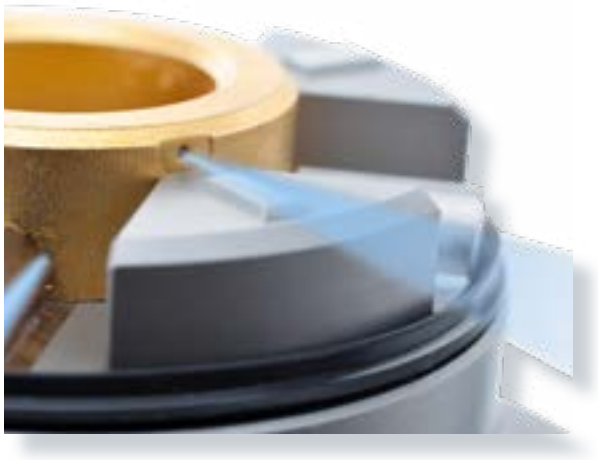
Features

- The patented prism system with stable integrated X-, Y-, and Z- references permit high precision positioning

  0.1 µm repetitive accuracy

  0.5 µm average changing accuracy

- Total height with pallet only 42 mm (1.654”)
- Completely made of stainless steel
- With a clamped pallet the system is completely sealed against dirt
- If no pallet is in the clamper the centering prisms and the Z-surfaces will be protected against con tamination with a pin sharp air jet
- Part detection by measuring the pneumatic pressure difference
- Clamping control via piston position sensor
- Clamping via spring pressure, opening via pneumatic pressure
- Integrated gripper interface for automatic change
- precise, securely, efficient



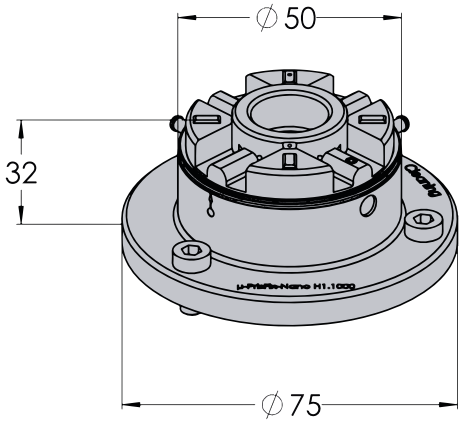
* Integrated cleaning (Carl Hirschmann “CenterClean”)

Spannsystem µ-PrisFix-Nano

Pneumatic-clamper

The pneumatic µ-PrisFix-Nano clamper H1.1000 and H1.1000A can be used for manual and automatic loading. Both are equipped with pneumatic cleaning and presence check capabilities.

The clamper H1.1000A is also equipped with an integrated sensor to check the position of the clamping piston. With the evaluation of this sensor and pneumatic presence check by the machine or handling system control, automatic pallet changing will guarantee high process reliability.



H 1.1000 µ-PrisFix-Nano Pneumatic Clamper

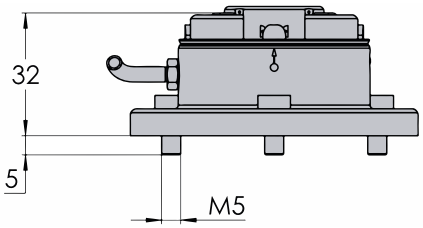
Completely rust-resistant.
Clamping via spring pressure, opening via pneumatic pressure. Dirt protected via a sealing ring and cleaning air (“Center Clean”).

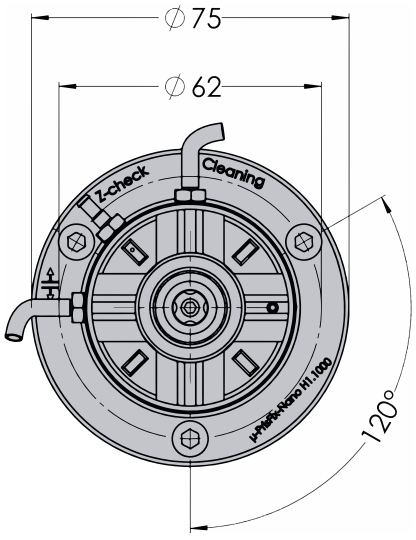
Part detection by measuring the pressure difference.

Repetitive accuracy	≤ 0,1 µm (≤ 0,000004”)
Average changing accuracy	≤ 0,5 µm (≤ 0,000019”)
Clamping height (without/with pallet)	32/42 mm
Clamping force	500 N
Pneumatic pressure (opening/cleaning)	6 bar

H 1.1000A µ-PrisFix-Nano Pneumatic Clamper

Same as H.1.000 but equipped with a piston check sensor.
(Clamping control via piston position sensor and part detection by difference pressure measuring).



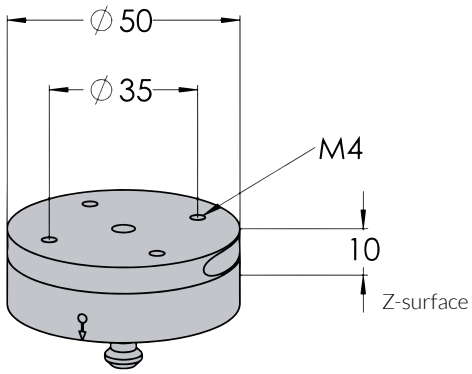


Clamping System µ-PrisFix-Nano

Pallets

Common features

- Completely made of rust-resistant materials
- Integrated gripper interface for automatic change



H 1.1005 µ-PrisFix-Nano Pallet

Completely rust resistant.

With 4 threads M4, 5 mm depth for workpiece fastening, hardened and lapped.

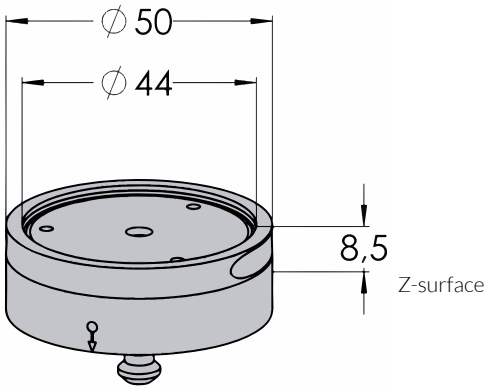
Integrated gripper interface for automatic handling.

Clamping journal included.

Diameter 50 mm

Adjustable clamping element

These patented components are used as an universal workpiece interface for highest concentricity (≤ 1 µm).

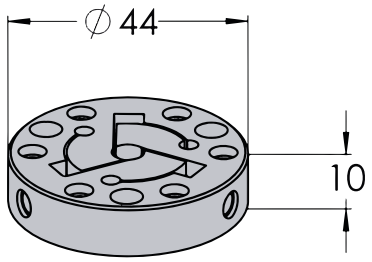


H 1.1005JP µ-PrixFix-Nano Clamping Element Holder (rust resistant)

For mounting the H1.1005JE-xx µ-PrisFix-Nano Adjustable Clamping Elements.

Complete with journal and integrated gripper interface for automatic handling.

Complete with clamping pins.



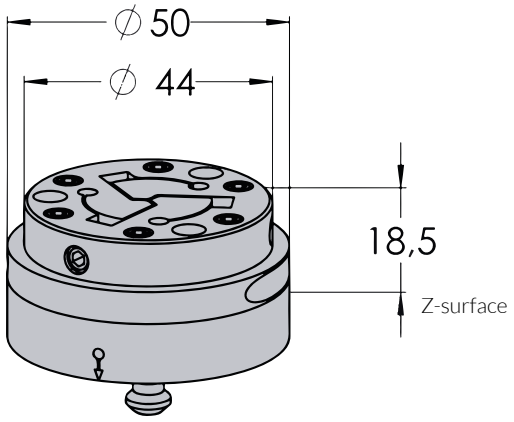
H 1.1005JE-xx Adjustable Clamping Element (Brass)

For accurate alignment of workpiece concentric run-out.

The adjustable clamping elements will be fixed in the Clamping Element Holder H1.1005JE-xx.

Adjustable concentricity	≤ 1 µm
Clamping diameter (xx)	Ø 1 mm bis Ø 15 mm

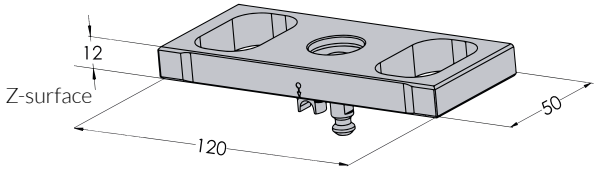
(On orders please specify exact diameter xx).



Dimensions of the H1.1005JP and H1.1005JE-xx assembled

Clamping System µ-prisFix-Nano

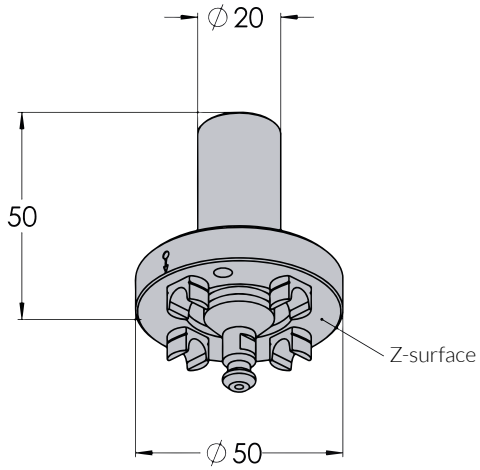
Alignment tools



H 1.1005AL µ-PrisFix-Nano Aligning Gauge

To align and center the µ-PrisFix clamper in X/Y direction.

Completely manufactured of rust resistant materials.



H 1.1005KD µ-PrisFix-Nano Test Bar

To align and control the axial and radial position of mounted µ-PrisFix clampers as well as concentricity when mounted on Carl Hirschmann tables and axes and rotating spindles.

Completely manufactured of rust resistant materials.

Overview

Our Clamping Systems

Clamping System	4000	5000	8000	9000	µ-PrisFix-Nano
Use for	Workpiece clamping and palletizing for wire EDM	Electrode / workpiece clamping and palletizing	Workpiece and fixture palletizing	Workpiece and fixture palletizing	Micro clamping system for high precision part manufacturing
Wire EDM	x				x
Sinking EDM		x	x	x	x
Micro manufacturing		x			x
Chipping		x	x	x	x
Laser machines		x	x	x	x
Mounting		x	x	x	x
Measurement technique		x	x		x
Repetitive accuracy	≤ 0.002 mm ≤ 0.00008"	≤ 0.002 mm ≤ 0.00008"	≤ 0.002 mm ≤ 0.00008"	≤ 0.005 mm ≤ 0.0002"	≤ 0.0001mm ≤ 0.000004"
Max. workpiece weight	150 kg	100 kg	300 kg	1000 kg / chuck	
Clamping force	---	18.000 N	60.000 N	10.000 N/ chuck pneumatic 26.000 N / chuck hydraulic	500 N
Automatic changable with handling units	x	x	x	x	x

Detailed information can be found in the respective catalogs and on the internet: **carlhirschmann.de**
If you have any questions or for a detailed/ comprehensive advice/ consultation, please do not hesitate to contact our sales staff.

Download area:

Visit our virtual showroom:

the **precision** benchmark

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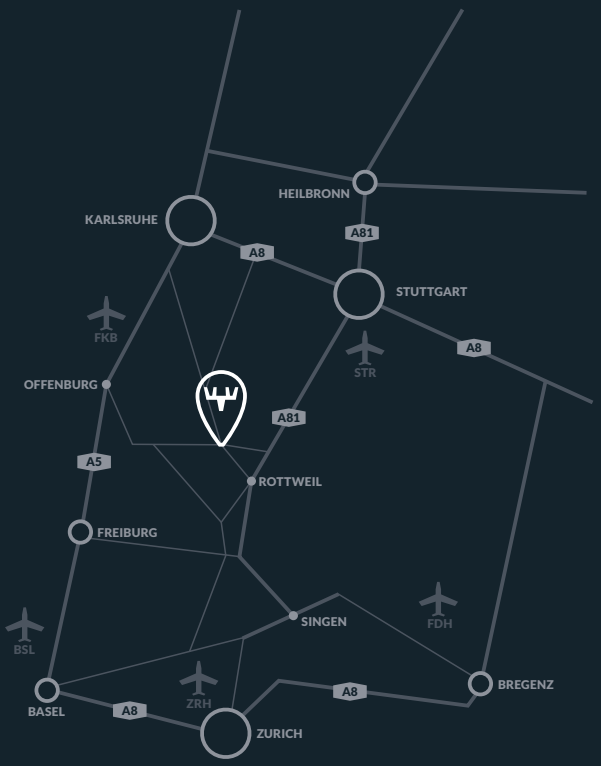

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