



ZERO CLAMP®  
Experience precision

**O r i g i n a l**

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I n s t r u c t i o n s**

**P u l l - o u t   f o r c e   t e s t e r**



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ZERO CLAMP® Pull-Out Force Tester Installation and Operating Instructions

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D-82057 Icking

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Issue: 4/22/2015

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## **1. General matters**

### **1.1 Use of the installation and operating instructions**

Dear customer

Many thanks for deciding to purchase our products. These installation and operating instructions contain useful information allowing you to familiarize yourself with your pull-out force tester before starting to use it for its intended purpose under the specified operating conditions. They contain important instructions to ensure functionally correct and cost-effective installation and operation.

The operating instructions have been created for use by installation, operating and maintenance staff, and must always be kept to hand at the place of use.

You have chosen a high-quality test device which operates at extremely high precision.

In the interests of product improvement we reserve the right to make changes in respect of versions, dimensions and materials.

Of course, we remain available to you at all times for aftersales service. Please contact us using the information set out below.

### **1.2 Customer Service contact information**

ZeroClamp GmbH  
Wadlhausen 14  
D-82057 Icking

Tel. +49 (0) 8178-90998-0  
info@zeroclamp.com

### **1.3 Spare parts and wearing parts**

The use of spare and wearing parts from third-party manufacturers can lead to hazards. Use only original parts that are either from the manufacturer or approved by him.

### **1.4 Warranty**

The warranty is 12 months from the date of delivery from the works, providing the tester is used for its intended purpose.

These operating instructions supersede all previous issues. The current issue of the operating instructions is available for downloading at: [www.zeroclamp.com](http://www.zeroclamp.com)

### **1.5 Scope of supply**

The scope of supply includes:

- the test device (pull-out force tester)
- clamping studs for NP 090, NP120, NP138 and NP190 (1 of each)

## 1.6 Installation declaration

The manufacturer: ZeroClamp GmbH  
Wadlhausen 14  
D-82057 Icking

hereby declares that the following products:

Product designation: Pull-out force tester

Type designation: 17921

Build year: 2013

comply with the following essential requirements of the **Machines Directive (2006/42/EC)**:  
Appendix I, Articles 1.1.1, 1.1.2, 1.1.3, 1.1.5, 1.1.6, 1.3.2, 1.3.3, 1.3.4, 1.3.7, 1.5.4, 1.6.1,  
1.6.2, 1.6.3, 1.6.4, 1.7.1.1, 1.7.2, and 1.7.4.

The following standards were applied:

DIN EN ISO 4414	Pneumatic fluid power -- General rules and safety requirements for systems and their components
DIN EN ISO 12100	Safety of machinery - General principles for design, risk assessment and risk reduction
ISO 16156	Safety Machine tools safety – Safety requirements for the design and construction of work holding chucks
ISO 19719	Machine tools — Work holding chucks — Vocabulary

The incomplete machine may not be brought into use until it has been incorporated into a machine and the machine into which it has been incorporated satisfies the provisions of the Machines Directive (2006/42/EC).

The manufacturer undertakes on request to communicate by electronic means the special documents relating to the incomplete machine.

The special technical documents relating to the machine were created in accordance with Appendix VII Part B.

Name of the authorized person for documentation: Klaus Hofmann

Address of the authorized person for documentation: see manufacturer's address

Icking,  
02.05.2013  
Date


Klaus Hofmann, Managing Director  
Signatory and data on the signatory


Signature


  
Unterschrift


## 2. Safety

### 2.1 General safety instructions

	<p><i>Warning!</i></p> <p>Accidental actuation of the zero point clamping system can lead to unintentional actuation of the test device.</p> <p>Disconnect the zero point clamping system from the compressed air supply before you undertake installation, adjustment, maintenance or set-up work.</p> <p>Whilst the zero point clamping system is in operation, secure the test device against unintentional actuation by fitting safety devices on the compressed air supply.</p>
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	<p><i>Warning!</i></p> <p>Before using the pull-out force tester, clear all liquids and dirt from the clamping pot to be tested.</p>
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	<p><i>Warning!</i></p> <p>If the axis of the clamping stud is horizontal, or if the test device is being used overhead, make sure that the test device is secured against falling.</p>
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	<p><i>Warning!</i></p> <p>If the zero point clamping system is actuated, the skin of the fingers on the clamping elements can be crushed.</p> <p>Do not reach into the clamping stud socket!</p>
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### 2.2 Use for the intended purpose

The test device must be used exclusively for testing ZeroClamp zero point clamping units. Use for the intended purpose includes compliance with the conditions specified by the manufacturer in respect of installation, commissioning, operation, ambient conditions and maintenance. Any use that is not within these conditions ranks as improper use. The manufacturer accepts no responsibility for damage resulting from improper use.

### **2.3 Structural modifications**

For reasons of safety, unauthorized changes and modifications are prohibited!

### **2.4 Training the operators**

The operators must have received instruction on the following topics:

- Functionality and operation of the pull-out force tester
- Functionality and operation of the zero point clamping system
- Servicing and cleaning work

All persons responsible for the installation, commissioning and maintenance of the tester must have read and understood the complete operating instructions, especially Section 1 "Safety". We recommend that the operating company obtains signatures to this effect.

Installation, removal, connection and commissioning may be performed only by authorized personnel. Operating techniques which adversely affect the functionality and operational safety of the test device must be avoided.

### 3. Operation

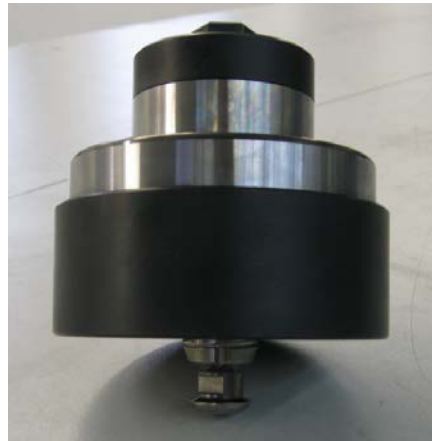
#### 3.1 Operating temperature

Minimum	15 °C
Maximum	40 °C

#### 3.2 Clamping force measurement

The actual clamping force capability of a clamping pot is measured by measuring the torque applied to the pull-out force gauge.

Measure the clamping force at regular intervals. ZeroClamp recommends that clamping pots are tested after every 100,000 clamping cycles, but in any case once a year. Basically it is the customer's responsibility to specify the test cycles.



##### 3.2.1 Measurement preparation

Restrain the hexagonal flange on the pull-out force tester and unscrew the clamping stud from the pull-out force tester by turning it anticlockwise (viewed from underneath the clamping stud) to the stop. Before doing this, clear all liquids and dirt from the clamping pot to be tested.

##### 3.2.2 Torque application

1. Apply compressed air to the clamping pot (to open it).
2. Place the pull-out force tester on the secured clamping pot. To do this, insert the mating clamping stud on the pull-out force tester into the open clamping pot.
3. Close the clamping pot (vent compressed air from the clamping pot).
4. With the pull-out force tester attached to the clamping pot, turn the tester clockwise by hand to the stop.
5. Using a torque wrench (not supplied), apply the necessary torque. The clamping pot must hold the clamping stud securely up to and including the specified torque.



### 3.2.3 Torque – pull-out force conversion table



Old revision status (left) serial number up to 61; Current revision status (right) serial number from 62

Old revision status						Current revision status					
Clamping pot size in mm	Ø 90	Ø 120	Ø 138	Ø 190	Tolerance	Clamping pot size in mm	Ø 90	Ø 120	Ø 138	Ø 190	Tolerance
Torque (Nm)	12,5	25	40	60	-10%	Torque (Nm)	22	44	70	105	-10%
Axial force (kN)	12,5	25	40	60		Axial force (kN)	12,5	25	40	60	
Serial number ≤ 61						Serial number ≥ 62					

**Caution!**

If the pull-out force applied exceeds the clamping force capability of the clamping pot, the clamping stud will be pulled out.

This means that wear will occur on the clamping stud during its use for pull-out tests. Repeatedly pulling out the clamping stud can cause cumulative wear on it so that although the clamping pot is in good working order the specified clamping force is not achieved.

Replace the worn clamping stud with one that is in as-new condition. The wear is a function of the number of tests. Examine the clamping stud regularly for signs of wear and damage.

If the differences in clamping force are such that the value achieved is below the nominal value by less than 10%, it is at the customer's discretion whether he continues to use the pot or sends it back to the manufacturer for overhaul. If the differences in clamping force are such that the value achieved is below the nominal value by more than 10% the customer is strongly recommended to send the clamping device to the manufacturer for checking.

### 3.2.4 Example of determination of the clamping force

A clamping pot of size  $\varnothing$  120 mm should be tested for a minimum clamping force of 23 kN (including the tolerance).

Perform the operations listed above (measurement preparation and torque application) and apply a torque of 41 Nm.

If the clamping stud is not pulled out, the clamping pot has a clamping force capability of at least 23 kN.

### 3.2.5 Exchanging worn clamping studs

Wear will occur on the clamping stud during its use for pull-out tests. Therefore exchange clamping studs when they become worn.



**Signs of wear on a clamping stud**

Clamping studs can be exchanged as follows:



**Tools required**

To exchange a clamping stud you will need a size 24 open-jaw spanner and a size 8 hexagon key L-wrench.



**Releasing a clamping stud**

Restraining the hexagon-headed bolt allows an anticlockwise rotary movement to be applied to the clamping stud using a hexagon key L-wrench. By this means the clamping stud can be completely removed from the pull force tester. The spindle then unscrews from the test device. The stud is released only when the stop is reached. Ensure that at all times you are working on a secure and solid workbench.



**Released stud and unscrewed spindle**

Performing the operations in the reverse sequence, a new stud can now be screwed finger-tight into the test device. Make sure the threads are clean at all times.


### **3.2.6 Calibration of the pull-out force tester**

Have the pull-out force tester calibrated (Article no.: 23417) annually. If the test device is used unusually frequently, we recommend shortening the calibration interval. For advice on this, refer to ZeroClamp®

#### 4. Care and servicing

The test device is lubricated for life and requires no servicing It should be stored in a clean and dry place.


#### 5. Residual risks

	Description of risk	Minimization of risk
	Disregard of safety instructions	Training the staff about the hazards

#### 6. Concluding remarks

The product is subject to continuous further development, and the manufacturer reserves the right to make technical changes.

Wherever possible these will be compatible with previous versions of the tester.

	<p><i>General instruction</i></p> <p>Comply at all times with the installation and operating instructions of the zero point clamping system and all associated systems.</p> <p>A current version of the installation and operating instructions is available for downloading at <a href="http://www.zeroclamp.com">www.zeroclamp.com</a></p>
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