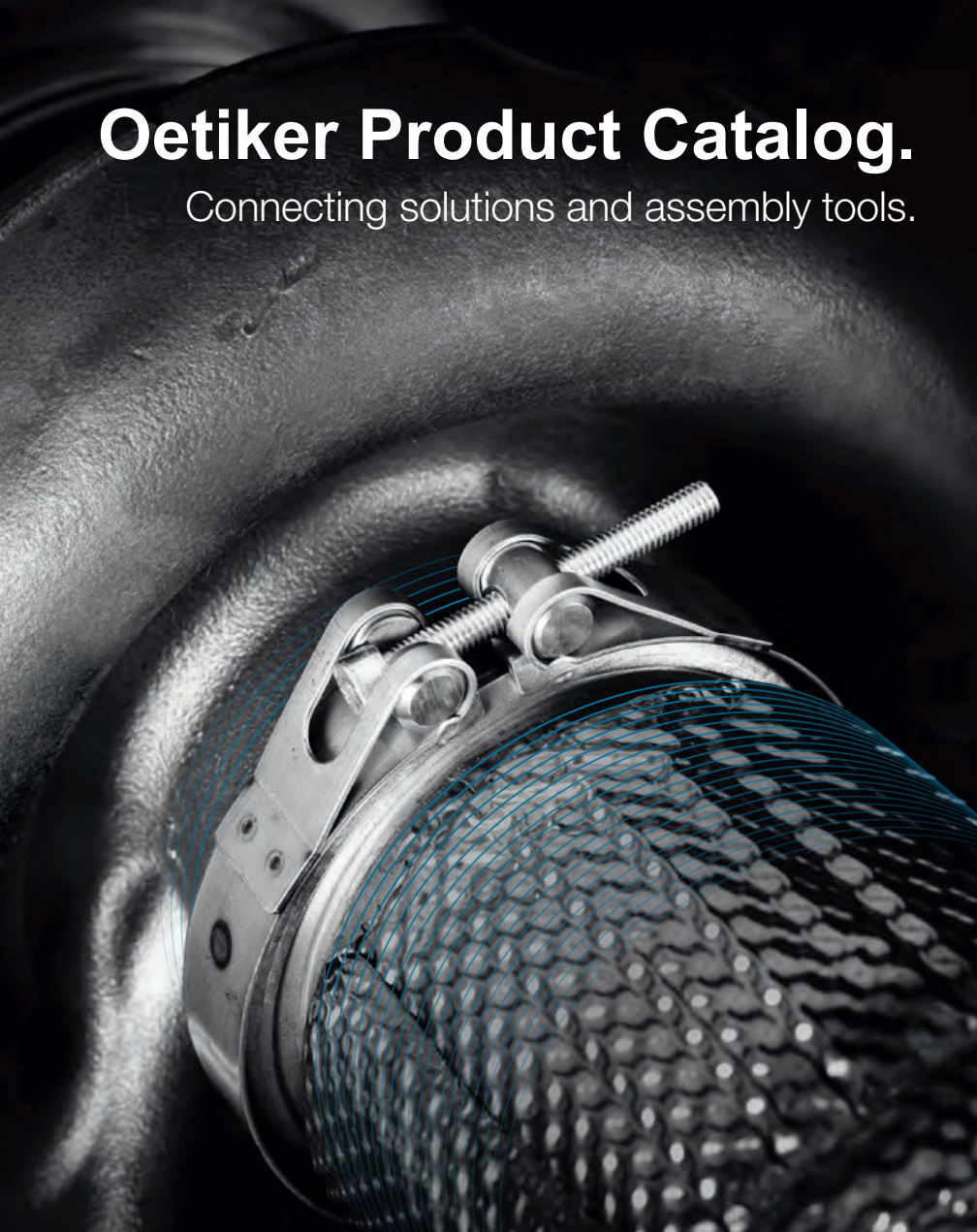


Oetiker Product Catalog.

Connecting solutions and assembly tools.



Connecting Technology

- 4 Our competencies
- 10 Typical connecting solutions: Automotive Industry
- 12 Typical connecting solutions: Industry & Trade

16 **Ear Clamps**

58 **Low Profile Clamps**

78 **Screw Clamps and Universal Clamps**

96 **Multi Crimp Rings**

100 **Profile Clamps**

104 **Straps**

108 **Assembly Tools**

144 **Quick Connectors**



Zurich, main station



Horgen,
Oetiker Headquarters

The optimum customer solution

Connected. Integrated. Systematic.

When the coffee tastes delicious every morning, when your car steers with ease, when the harvest is collected reliably, and when everything goes according to plan in the operating room: be assured Oetiker connecting technology played a part in it.

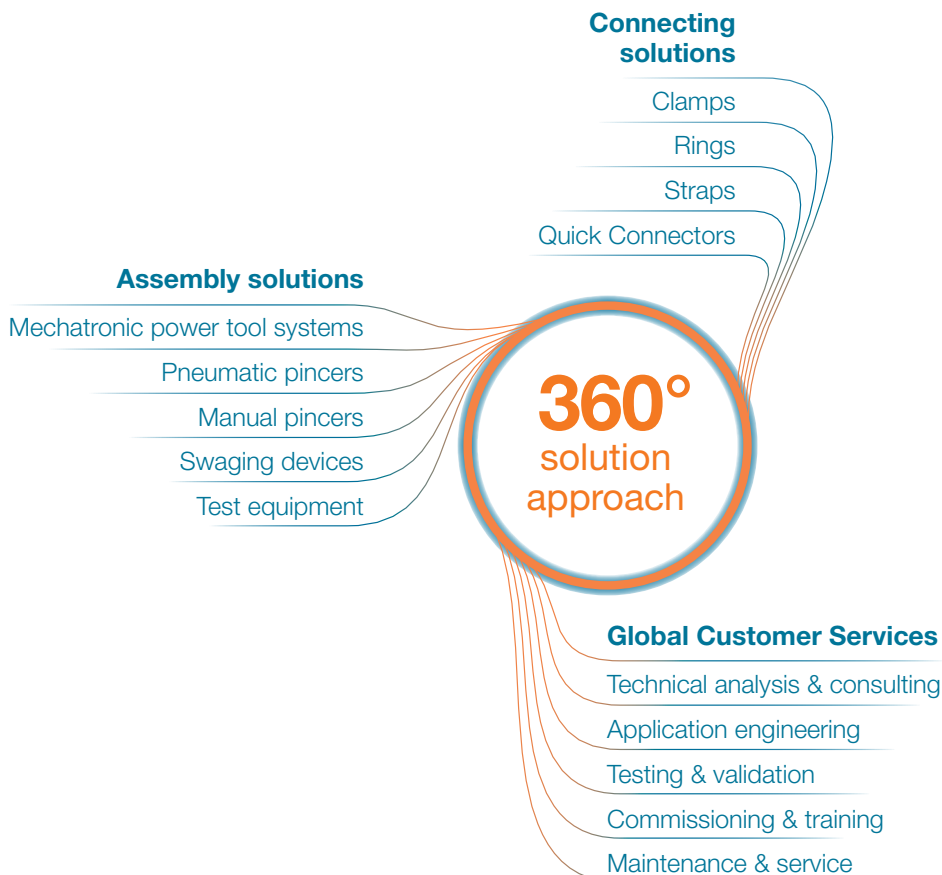
Who invented it?

Hans Oetiker. In 1951, he invented the first ear clamp – a global innovation which is still an integral part of the Oetiker product range. But the ear clamp was only the beginning. Step by step, new product lines and services were added. Today, we continue to be fascinated by the sheer variety of optimum connecting and assembly solutions.

Systematic customer solutions

Our connecting solutions are composed of thoroughly engineered products, complimented with an array of readily available assembly tools, and fortified with comprehensive support services.

We call it the “360° Solution Approach”. Receive technical consulting and support from our experts when selecting your optimum connecting solution and when carrying out application tests based on your components. Together, we’ll help you find out which closing tools and calibration instruments work perfectly for your project. And we take care of commissioning and maintenance for you on site.



Our “360° Solution Approach” shows results: Oetiker customers benefit from the all-inclusive range of connecting solutions, assembly tools, and – service and application engineering.

Your requirements are the starting point

When customer requirements are demanding, the Oetiker experts are delighted. Our integrated “Solution Approach” makes it possible to find the optimum solution for you. We consult, analyze, and test for you until every detail is correct.

We never let up on finding your best connections

Oetiker continuously develops and tests its products. We work on new solutions daily with our own Research and Development and Application centers in Europe, Asia, and the America’s.

From the center of Europe to the whole world

Oetiker is headquartered in Horgen on Lake Zurich in Switzerland. It is still a family-owned company, but has expanded to more than 30 offices, over 1,400 employees, a network of production and sales companies in Europe, North America and Asia, and it has Oetiker customers in over 70 countries. And it always meets the high Swiss quality standards.

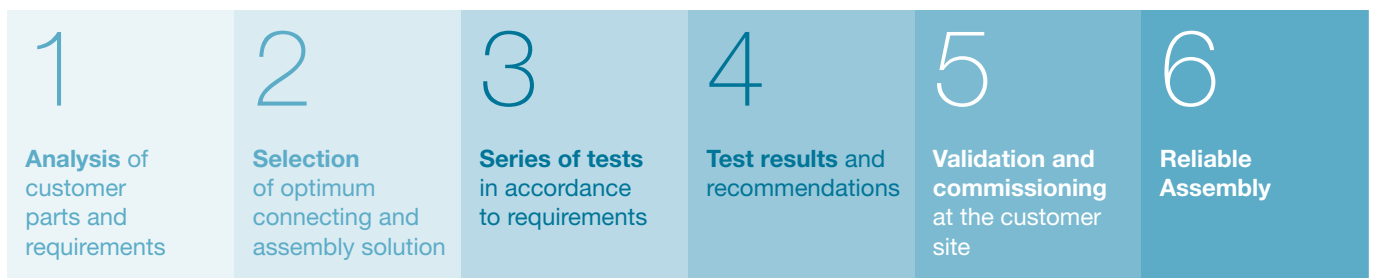
Why the future is our present

For Oetiker, being environmentally friendly means: using recyclable materials, avoiding chemical additives as much as possible, and carefully using resources.

Every new process and every new material is investigated well before it is introduced. Its meaning for employees and customers and also impacts on planning, production and sales, ecological compatibility and safety. Our production companies are certified according to ISO/TS 16949 and ISO 9001 standards and to the environment norm ISO 14001.

Quality products are the basis of our business. The Oetiker “Solution Approach” includes much more: we continually refine our expertise and support our customers throughout their production processes. We do this each and every day – a promise you can rely on.

Six stages to the optimum customer solution



Unique quality for your connections.

Connections that keep their promises

When it comes to our customers' requirements, we take care of every detail, just as with our own products, because we know your high quality connections must be reliable every time. During product development, material selection, processing, and the final quality control, we pay meticulous attention to every minuscule detail.

This is why Oetiker connecting solutions are sturdy and resilient – and leakages are a thing of the past. To ensure that each assembly keeps its promise, we also produce premium-quality closing tools. This guarantees our customers secure and verifiable assembly processes.

The highest quality from the ground up: The materials
We exclusively manufacture our clamps and rings from selected high-quality materials to ensure our products surpass your requirements.

Comprehensive system



Oetiker



Others



Comprehensive system: The reliable customer solution
To ensure that each connection holds to its promise in the long term, we produce our high-quality clamps and rings as well as our assembly tools in our own plant. This guarantees a secure and verifiable assembly result at all times.

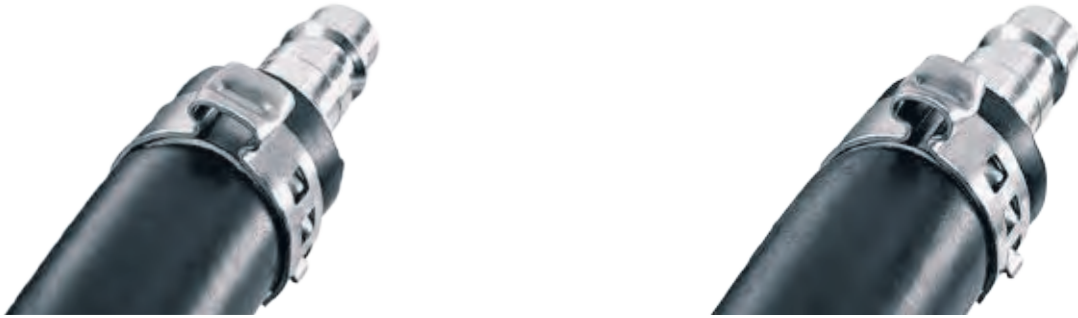
The quality is in the details: Burr free strip edges
In order to protect clamped parts from damage and to prevent injuries during assembly, we use a unique procedure to manufacture burr-free strip edges at our own plant – this represents a technically important advantage compared with conventional strip edges, even though the difference from the edges of conventional strips is barely visible.

To ensure everything runs smoothly:
Dimensions, identification and ordering
Oetiker Clamps and Rings are manufactured to metric dimensions. For identification purposes, the nominal diameter is stamped on each product.

To determine the correct clamp diameter, push the hose onto the attaching material, (e.g. the nipple), and then measure the hose's outer diameter. Select a clamp whose average value of the diameter range is slightly greater than the hose's outer diameter.

Always quote the 8-digit item number when ordering.
You'll find them on the catalog pages.

Tolerance compensation through clamp ear



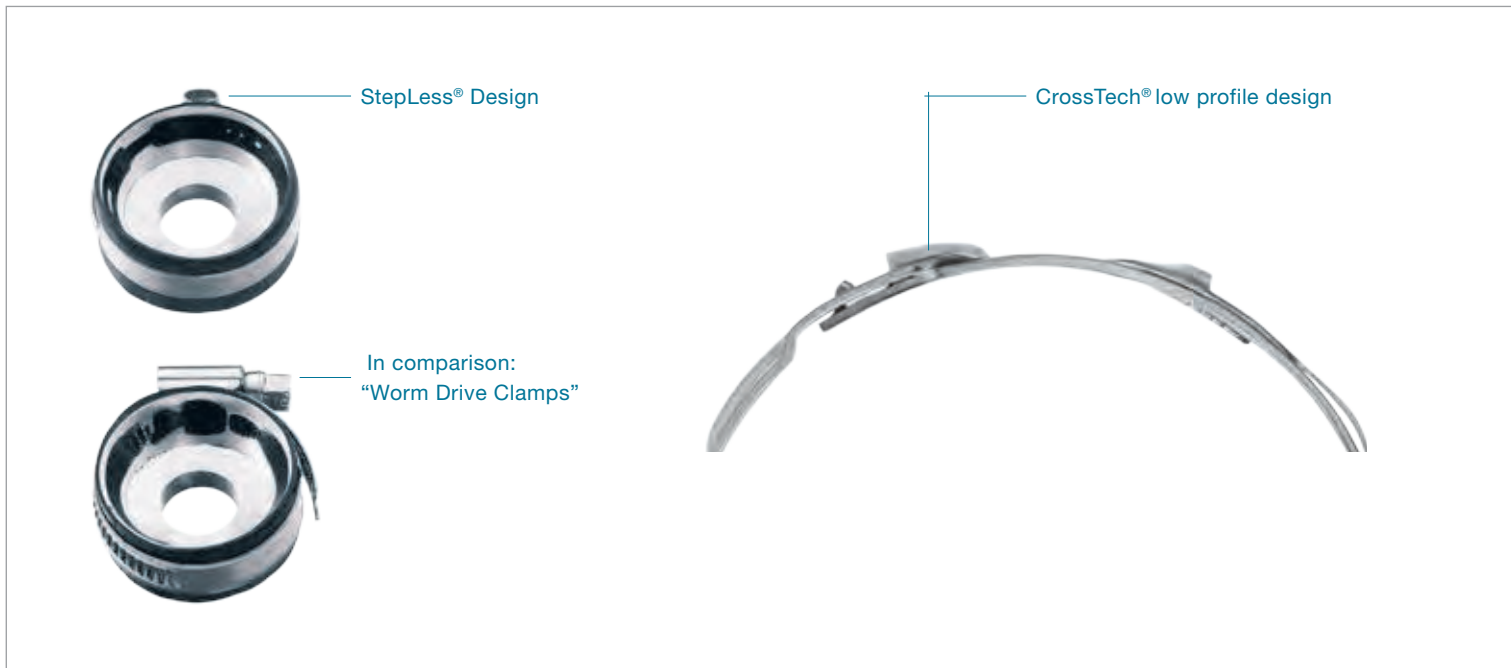
Intelligently made: Tolerance compensation
As the result of production tolerances, no two components are identical. This does not represent a problem for our ear clamps, as the clamp ear can simply compensate for tolerances within a certain range.

Effective and reliable: StepLess® design

This special design eliminates steps and/or overlaps on the inner circumference of the clamp. Because the tongue resides in a groove, the “tongue-in-groove” feature exerts pressure on the assembled parts over 360 degrees. This enables the clamp to apply a continuous radial force completely around the connection’s diameter.

CrossTech®

The innovative CrossTech® feature is highly space-efficient and provides an ultra low profile design for a very low imbalance on rotating parts.



- + Uniform compression
- + Uniform surface pressure



- + Ultra low profile design
- + Very low imbalance on rotating parts

ToothLock®

Interlocked with its teeth, the distinctive “ToothLock®” feature offers extremely high and permanent compression rates and outstanding expansion resistance – strong enough for the toughest connections.

It also supports shock and vibration resistance and helps the clamp to withstand thermal stress.

The ToothLock® is designed as a self-locking mechanism and increases the performance due to the low spring back rate. With its multiple tooth-locking positions, it compensates component tolerances.

ToothLock® Technology

**ToothLock®**

- + Multiple tooth-locking positions adjust to component tolerances
- + Very high and permanent compression
- + Low spring back maintains superior radial load performance
- + Highly pressure and expansion-resistant

The data in this catalog are based on many years experience. They are intended for reference, not as design specifications.

Typical connecting solutions Automotive Industry



| | Product Groups | | Cardan shafts/ drive shafts | Airbag systems | |
|--|----------------|--------|--------------------------------|----------------|--|
| ToothLock® Ear Clamp | 293 | p. 20 | | | |
| StepLess® Ear Clamps – the next generation | 123 & 193 | p. 24 | | | |
| StepLess® Ear Clamps | 117 & 167 | p. 32 | | | |
| 1-Ear Clamp with stud | 103 | p. 54 | | | |
| 1-Ear Clamp SV | 153 | p. 56 | | | |
| 1-Ear Clamp “Open End” | 195 | p. 19 | | | |
| ToothLock® Low Profile Clamp | 292 | p. 60 | | | |
| StepLess® Low Profile Clamp | 168 | p. 64 | | | |
| StepLess® Low Profile Clamp | 192 | p. 72 | | | |
| StepLess® Screw Clamp | 178 | p. 80 | | | |
| Worm Drive Clamps | 126 & 177 | p. 90 | | | |
| Multi Crimp Rings | 150 | p. 98 | | | |
| Levi Heavy Duty V-Profile Clamps | 280 | p. 102 | | | |
| Levi Heavy Duty Straps | 283 | p. 106 | | | |























| Cooling and heating water circuits | Steering systems | Oil pipes | Fuel systems | Exhaust systems | High pressure systems |
|------------------------------------|------------------|------------|--------------|-----------------|-----------------------|
| | | | | | Red bar |
| Red bar | Red bar | Red bar | | Red bar | Red bar |
| Red bar | Red bar | Red bar | Red bar | Red bar | Red bar |
| | | | | | |
| | | | | Red bar | |
| | | | | Red bar | |
| | | | | | |
| Orange bar | Orange bar | | | | |
| | Orange bar | Orange bar | | | Orange bar |
| Green bar | | | | | Green bar |
| Green bar | | Green bar | Green bar | Green bar | Green bar |
| Teal bar | Teal bar | Teal bar | Teal bar | | Teal bar |
| | | | | Blue bar | Blue bar |
| | | | Brown bar | Brown bar | |



Typical connecting solutions

Industry and Trade

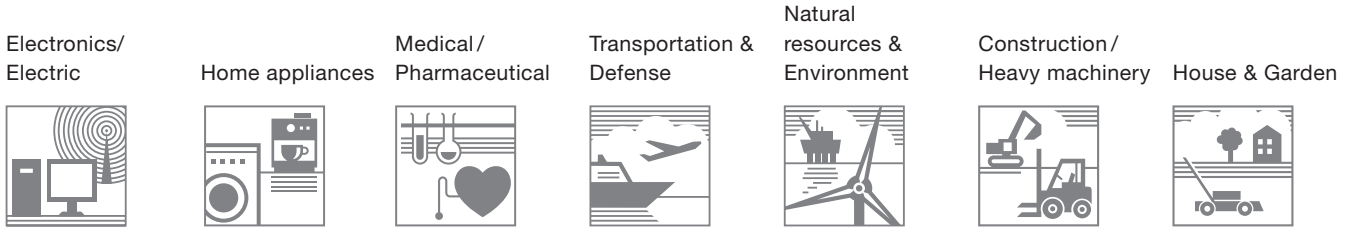
| Product Groups | | | | Aftermarket | Food & Beverage | Agriculture | |
|--|-----------|--------|--|---|---|---|--|
| | | | |  |  |  | |
| StepLess® Ear Clamps – the next generation | 123 & 193 | p. 24 |  |  |  | | |
| StepLess® Ear Clamps | 117 & 167 | p. 32 |  |  |  | | |
| StepLess® Ear Clamp PEX Series | 167 | p. 38 | | | | | |
| 1-Ear Clamps with mechanical interlock | 105 & 155 | p. 40 | | |  | | |
| Adjustable Clamps | 109, 159 | p. 44 |  | |  | | |
| Adjustable Clamps | 113 & 163 | p. 47 |  | |  | | |
| 1-Ear Clamps | 153 & 154 | p. 50 |  |  |  | | |
| 2-Ear Clamps | 101 & 151 | p. 51 |  | |  | | |
| Clamp ER | 194 | p. 76 | | | | | |
| StepLess® Screw Clamp | 178 | p. 80 | | | | | |
| Worm Drive Clamp | 180 | p. 82 | | |  | | |
| Universal Clamp | 174 | p. 86 | | |  | | |
| Worm Drive Clamps | 126 & 177 | p. 90 |  | |  | | |
| Multi Crimp Rings | 150 | p. 98 | | | | | |
| Levi Heavy Duty V-Profile Clamps | 280 | p. 102 | | |  | | |
| Levi Heavy Duty Straps | 283 | p. 106 | | |  | | |



Food & Beverage: Connection in coffee machine



Food & Beverage: Connection in vending machine



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Home appliances: Water supply for washing machine



Medical: Connection in external heart pump



Electronics: Water cooling in computer

Product families

p. 16

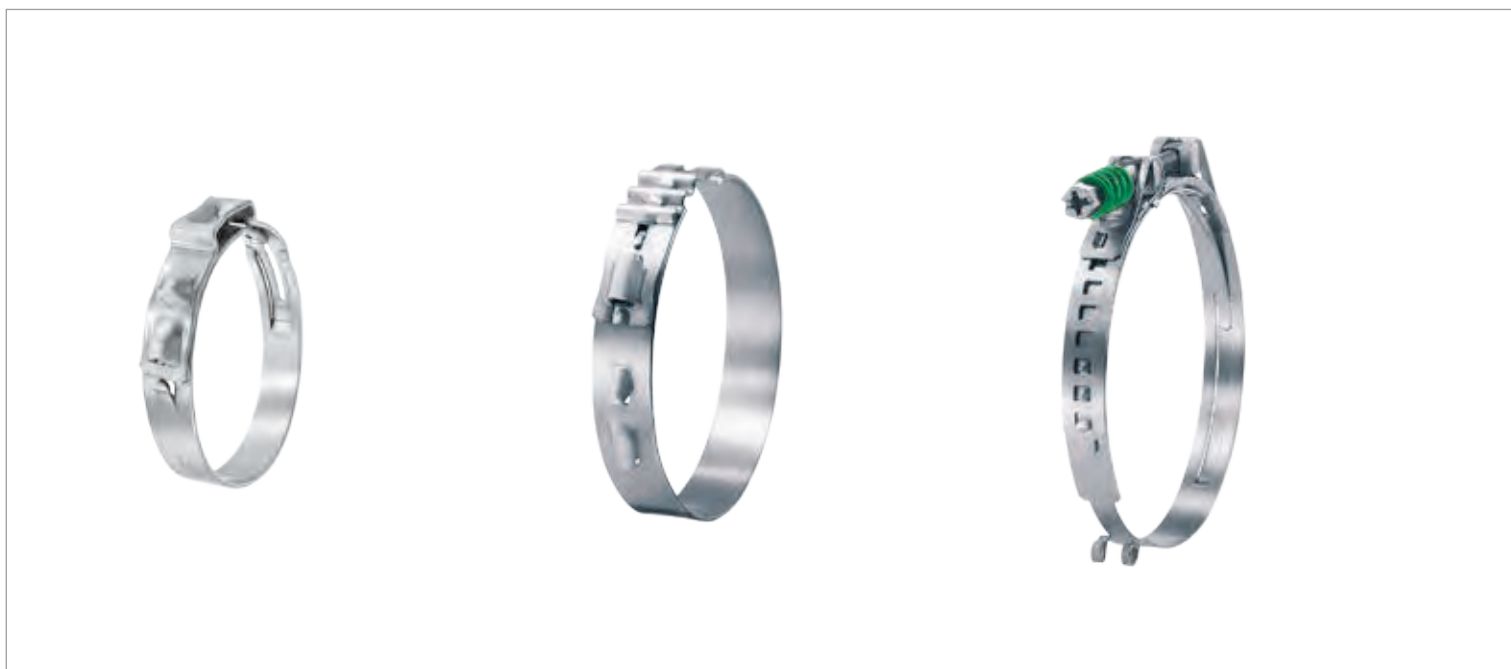
Ear Clamps

p. 58

Low Profile Clamps

p. 78

Screw Clamps and Universal Clamps



Fast and simple assembly

High, adaptable radial forces

Tolerance compensation

Visual closure check

Reusable: can be repeatedly opened and re-assembled*

Low assembled height, minimum space requirement

Low imbalance on rotating parts

Tolerance compensation*

Reusable

Large clamping range: can be set to several different nominal diameters*

Fast and simple assembly

Compensate for diameter changes due to thermal expansion*

* depending on the product type

p. 96

Multi Crimp Rings

p. 100

Profile Clamps

p. 104

Straps



Constant, uniform, circumferential compression

Minimum space requirement, no imbalance on rotating parts

Flexible diameter reduction up to 6 mm*

Aluminum model – lightweight

Lightweight and space efficient

Superior joint integrity

Quick and easy assembly

Engineered to suit customer requirements

Ultimate flexibility: many designs and configurations

Quick and easy assembly

Engineered to suit customer requirements

Ear Clamps

p. 20

ToothLock® Ear Clamp
293

p. 24

StepLess® Ear Clamps
123 & 193 – next generation

p. 32

StepLess® Ear Clamps
117 & 167



ToothLock® Technology:

- + Very high and permanent compression rates
- + Superior radial load performance
- + Highly pressure and expansion resistant

360° StepLess®:

- + Powerful all-round seal
- + Uniform compression

Enlarged ear width

(17 mm):

- + Enhanced clearance for easy assembly
- + Extended diameter range

360° StepLess®:

- + Uniform compression and uniform surface pressure

Closed interlock:

- + High radial loads
- + Smooth outer contour

Clamp ear:

- + Compensates for component tolerances
- + Adjustable surface pressure

Dimple:

- + Increased clamping force

360° StepLess®:

- + Uniform compression and uniform surface pressure

Clamp ear:

- + Compensates for component tolerances

+ Adjustable surface pressure

Dimple:

- + Increased clamping force

Oetiker will be pleased to help you to find the correct choice for your application. Send sample parts and all relevant information for your specific application to Oetiker, and you will receive recommendations for product type, diameter, and method of assembly.

p. 40

1-Ear Clamps with mechanical interlock
105 & 155

p. 44

Adjustable Clamps
109, 159

p. 47

Adjustable Clamps
113 & 163



Clamp ear:
+ Fast and simple assembly
+ Visible deformation provides evidence of proper closure
Dimple:
+ Increased clamping force

Choice of engagement positions:
+ Clamp can be adjusted to several nominal diameters
Clamp ear:
+ Fast and simple assembly
+ Visible deformation provides evidence of proper closure
Dimple:
+ Increased clamping force

Choice of engagement positions:
+ Clamp can be adjusted to several nominal diameters
Inner ring with radial guidance:
+ Effective and powerful all-round sealing
Clamp ear:
+ Compensates for component tolerances
+ Adjustable surface pressure

Ear Clamps

p. 50

1-Ear Clamps
153 & 154

p. 51

2-Ear Clamps
101 & 151



Compact one-piece clamps:

- + Robust, secure connections
- + Miniature sizes

With insert:

- + Pre-shaped insert
- + Effective and powerful all-round sealing

Clamp ear:

- + Compensates for component tolerances
- + Adjustable surface pressure

Dimple:

- + Increased clamping force

2-Ear version:

- + Extended clamping range

Clamp ear:

- + Fast and simple assembly
- + Visible deformation of clamp ear provides evidence of proper closure

Oetiker will be pleased to help you to find the correct choice for your application. Send sample parts and all relevant information for your specific application to Oetiker, and you will receive recommendations for product type, diameter, and method of assembly.

p. 54

1-Ear Clamp with stud
103

p. 56

1-Ear Clamp SV¹
153

1-Ear Clamp "Open End"^{**}
(on request)
195



- Secure:
+ reliable fixation of airbag inflators within occupant safety systems
- Flexible:
+ Easily adjustable clamp positioning
- Strong:
+ High strength low alloy material with high retention properties
+ Good corrosion resistance

Application:
Airbag inflators
Sanitary pipes
Compressed air lines
etc.

- Radial assembly:
+ Clamp can be opened to clear obstructions for axial or radial assembly
- Quick closure:
+ Positive engagement of interlock ensures simple
+ Secure closure
- Scale resistant stainless steel:
+ Excellent strength and corrosion resistance at high temperatures

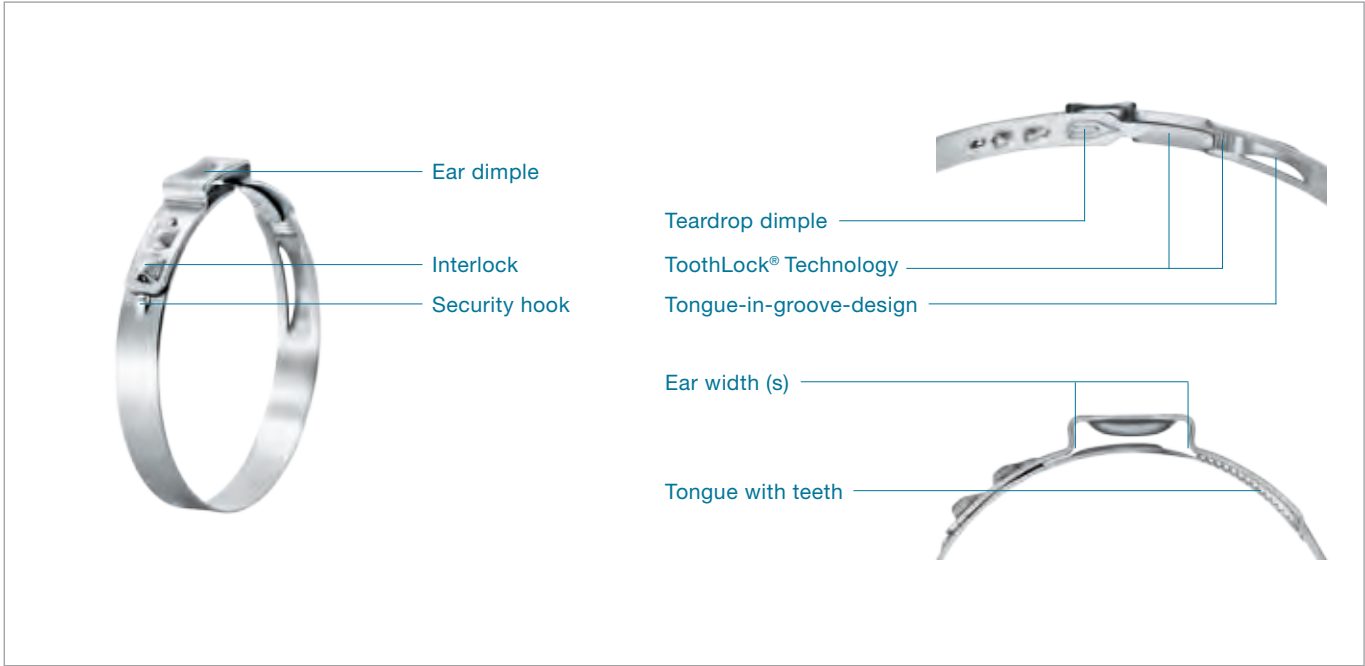
Application:
Exhaust systems
Heating systems
etc.

¹ SV = quick action

- Open:
+ Simple, radial assembly for ergonomic handling
- Flexible:
+ Customer-specific modifications are possible
- Bridged ear:
+ Good sealing and excellent retention properties

Application:
Exhaust systems
Airbags
etc.

^{*} For detailed ordering information please contact your local Oetiker branch.



ToothLock® Technology: very high and permanent compression rates, superior radial load performance, highly pressure and expansion resistant

360° StepLess®: uniform compression, powerful all-round seal

Enlarged ear width (17 mm): enhanced clearance for easy assembly, extended diameter range

Security hook: prevents unintended opening during transport

Closed interlock: smooth outer contour supports injury-free installation

Burr-free strip edges: reduced risk of damage to parts being clamped

ToothLock® Ear Clamp 293

Target applications

Air Induction Systems

Other applications upon verification by Oetiker

Material

Stainless Steel, Material no. 1.4301/UNS S30400

Corrosion resistance according to DIN EN ISO 9227

≥ 1000 hours

Series

| Size range | width x thickness | ear width |
|-----------------|-------------------|-----------|
| 40.0 – 120.5 mm | 10.0 x 1.0 mm | 17 mm |

Sizes

Diameter graduation 0.5 mm

Some sizes are only available if an appropriate minimum quantity is ordered.

ToothLock®

Interlocked with its teeth, the distinctive “ToothLock®” feature offers extremely high and permanent compression rates and outstanding expansion resistance – strong enough for the toughest connections.

It also supports shock and vibration resistance and helps the clamp to withstand thermal stress.

The ToothLock® is designed as a self-locking mechanism and increases the performance due to the low spring back rate. With its multiple tooth-locking positions, it compensates component tolerances.

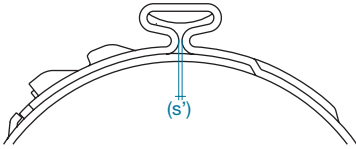
Security hook

The security hook securely holds the clamp geometry together during transportation.

Clamp ear (closing element)

Using tools designed by Oetiker, the clamp is closed by drawing together the lower radii of the “ear”. The maximum diameter reduction is proportional to the open “ear” width (s). The theoretical maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{Ear width (s)} \cdot 17 \text{ mm}}{\pi} = \frac{17 \text{ mm}}{\pi} = 5.4 \text{ mm}$$



Note: the above sketch shows the appearance of a closed “ear” (s’); it does not necessarily indicate an effective closed assembly.

Clamp Sizing

The following applies as a guideline: To determine the correct clamp diameter, push the hose onto the attaching material, (e.g. the nipple), and then measure the outer diameter of the hose. Select a clamp whose average value of the size range is slightly greater than the hose’s outer diameter. To ensure full ToothLock® engagement and a sufficient closure of the clamp the nominal diameter has to be reduced by at least 2.2 mm (> 40% of the original ear width) and the correct closing force has to be applied during assembly.

Assembly

Assembly Recommendations

The clamp’s ear should be closed at a uniform rate not exceeding the recommended maximum closing force. This will ensure clamp tension remains constant without overloading individual components of the assembly being joined, and of the clamps. Oetiker calls this installation method “force priority”. Force priority ensures that tolerance compensating of the clamp remains functional for every installation. This insures the resulting radial force remains approximately the same for every assembly, independent of any component’s dimensional fluctuation. If Oetiker’s ELK electronically controlled pneumatic pincers are used in force priority mode, installations can be monitored to ensure repeatable installations are achieved at the proper force.

Assembly Instructions



For proper assembly, position the pincer jaws onto the “ear” of the clamp. Close the pincer jaws to compress the ear of the clamp. This reduces the diameter of the ToothLock® Ear Clamp. The tool can be removed once the pincer jaws open after the ear is clamped.

To ensure full ToothLock® engagement and a sufficient closure of the clamp, the nominal diameter has to be reduced by at least 2.2 mm (minimum diameter reduction) and the correct closing force has to be applied during assembly.

Closing force

As a matter of principle, the closing force selection is closely related to the desired compression or surface pressure of the

material to be assembled. The resistance against the clamp corresponds to the applied force, so that the defined closing force is significantly reduced if soft materials are compressed. The maximum closing force is displayed in the table below, it specifically refers to thermoplastics.

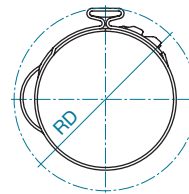
Block closure

Block closure is when the installation force fully closes the ear, resulting in both ear legs touching (vertical members between the ear dimple and clamp radius). When this occurs the installation force is absorbed by compressing the legs rather than transferring the installation forces to the parts being clamped. If installation forces are going to be measured, a block closure must be avoided.

Rotation diameter

The rotation diameter (RD) of an assembled clamp can be critical design information for applications which require a rotation within a limited open space. It changes, depending on the resulting ear gap. Maximum rotation diameter must be determined with application specific tests.

$$RD = \text{closed diameter} + 19.6 \text{ mm}$$



Important

- The ear height is a natural result of ear deformation. Do not influence the ear height, either by changing the ear gap or with built-in hold-down devices in installation tools.
- Single tool stroke closure only, do not apply secondary crimping force.

Installation data

| Material dimensions | Size range | Ear width | Maximum closing force |
|---------------------|-----------------|-----------|-----------------------|
| 10 x 10 mm | 40.0 – 120.5 mm | 17 mm | 7500 N* |

* For closing forces ≥ 7000 N, with the HO 7000 pneumatic pincer, an inlet pressure of > 6.6 bar is required.

This closing force is intended as a guide, which may vary depending on the type and tolerances of parts being clamped. To ensure optimum clamp selection, we recommend conducting functional tests with several assemblies.

Order information 293

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|-------------|-----------------------|-----------------|
| Band width 10 mm, thickness 1.0 mm (1010R) | | | |
| 29300011 | 040.0-1010R | 17 | 34.6 – 40 |
| 29300013 | 040.5-1010R | 17 | 35.1 – 40.5 |
| 29300015 | 041.0-1010R | 17 | 35.6 – 41 |
| 29300017 | 041.5-1010R | 17 | 36.1 – 41.5 |
| 29300019 | 042.0-1010R | 17 | 36.6 – 42 |
| 29300021 | 042.5-1010R | 17 | 37.1 – 42.5 |
| 29300023 | 043.0-1010R | 17 | 37.6 – 43 |
| 29300025 | 043.5-1010R | 17 | 38.1 – 43.5 |
| 29300027 | 044.0-1010R | 17 | 38.6 – 44 |
| 29300029 | 044.5-1010R | 17 | 39.1 – 44.5 |
| 29300031 | 045.0-1010R | 17 | 39.6 – 45 |
| 29300033 | 045.5-1010R | 17 | 40.1 – 45.5 |
| 29300035 | 046.0-1010R | 17 | 40.6 – 46 |
| 29300037 | 046.5-1010R | 17 | 41.1 – 46.5 |
| 29300039 | 047.0-1010R | 17 | 41.6 – 47 |
| 29300041 | 047.5-1010R | 17 | 42.1 – 47.5 |
| 29300043 | 048.0-1010R | 17 | 42.6 – 48 |
| 29300045 | 048.5-1010R | 17 | 43.1 – 48.5 |
| 29300047 | 049.0-1010R | 17 | 43.6 – 49 |
| 29300049 | 049.5-1010R | 17 | 44.1 – 49.5 |
| 29300051 | 050.0-1010R | 17 | 44.6 – 50 |
| 29300053 | 050.5-1010R | 17 | 45.1 – 50.5 |
| 29300055 | 051.0-1010R | 17 | 45.6 – 51 |
| 29300057 | 051.5-1010R | 17 | 46.1 – 51.5 |
| 29300059 | 052.0-1010R | 17 | 46.6 – 52 |
| 29300061 | 052.5-1010R | 17 | 47.1 – 52.5 |
| 29300063 | 053.0-1010R | 17 | 47.6 – 53 |
| 29300065 | 053.5-1010R | 17 | 48.1 – 53.5 |
| 29300067 | 054.0-1010R | 17 | 48.6 – 54 |
| 29300069 | 054.5-1010R | 17 | 49.1 – 54.5 |
| 29300071 | 055.0-1010R | 17 | 49.6 – 55 |
| 29300073 | 055.5-1010R | 17 | 50.1 – 55.5 |
| 29300002 | 056.0-1010R | 17 | 50.6 – 56 |
| 29300076 | 056.5-1010R | 17 | 51.1 – 56.5 |
| 29300078 | 057.0-1010R | 17 | 51.6 – 57 |
| 29300080 | 057.5-1010R | 17 | 52.1 – 57.5 |
| 29300082 | 058.0-1010R | 17 | 52.6 – 58 |
| 29300084 | 058.5-1010R | 17 | 53.1 – 58.5 |
| 29300086 | 059.0-1010R | 17 | 53.6 – 59 |
| 29300088 | 059.5-1010R | 17 | 54.1 – 59.5 |
| 29300090 | 060.0-1010R | 17 | 54.6 – 60 |
| 29300092 | 060.5-1010R | 17 | 55.1 – 60.5 |
| 29300094 | 061.0-1010R | 17 | 55.6 – 61 |
| 29300096 | 061.5-1010R | 17 | 56.1 – 61.5 |
| 29300098 | 062.0-1010R | 17 | 56.6 – 62 |
| 29300100 | 062.5-1010R | 17 | 57.1 – 62.5 |

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|----------|-------------|-----------------------|-----------------|
| 29300102 | 063.0-1010R | 17 | 57.6 – 63 |
| 29300104 | 063.5-1010R | 17 | 58.1 – 63.5 |
| 29300106 | 064.0-1010R | 17 | 58.6 – 64 |
| 29300108 | 064.5-1010R | 17 | 59.1 – 64.5 |
| 29300110 | 065.0-1010R | 17 | 59.6 – 65 |
| 29300112 | 065.5-1010R | 17 | 60.1 – 65.5 |
| 29300114 | 066.0-1010R | 17 | 60.6 – 66 |
| 29300116 | 066.5-1010R | 17 | 61.1 – 66.5 |
| 29300118 | 067.0-1010R | 17 | 61.6 – 67 |
| 29300120 | 067.5-1010R | 17 | 62.1 – 67.5 |
| 29300000 | 068.0-1010R | 17 | 62.6 – 68 |
| 29300123 | 068.5-1010R | 17 | 63.1 – 68.5 |
| 29300125 | 069.0-1010R | 17 | 63.6 – 69 |
| 29300003 | 069.5-1010R | 17 | 64.1 – 69.5 |
| 29300001 | 070.0-1010R | 17 | 64.6 – 70 |
| 29300004 | 070.5-1010R | 17 | 65.1 – 70.5 |
| 29300009 | 071.0-1010R | 17 | 65.6 – 71 |
| 29300010 | 071.5-1010R | 17 | 66.1 – 71.5 |
| 29300132 | 072.0-1010R | 17 | 66.6 – 72 |
| 29300005 | 072.5-1010R | 17 | 67.1 – 72.5 |
| 29300006 | 073.0-1010R | 17 | 67.6 – 73 |
| 29300136 | 073.5-1010R | 17 | 68.1 – 73.5 |
| 29300138 | 074.0-1010R | 17 | 68.6 – 74 |
| 29300140 | 074.5-1010R | 17 | 69.1 – 74.5 |
| 29300142 | 075.0-1010R | 17 | 69.6 – 75 |
| 29300144 | 075.5-1010R | 17 | 70.1 – 75.5 |
| 29300146 | 076.0-1010R | 17 | 70.6 – 76 |
| 29300148 | 076.5-1010R | 17 | 71.1 – 76.5 |
| 29300150 | 077.0-1010R | 17 | 71.6 – 77 |
| 29300008 | 077.5-1010R | 17 | 72.1 – 77.5 |
| 29300007 | 078.0-1010R | 17 | 72.6 – 78 |
| 29300154 | 078.5-1010R | 17 | 73.1 – 78.5 |
| 29300156 | 079.0-1010R | 17 | 73.6 – 79 |
| 29300158 | 079.5-1010R | 17 | 74.1 – 79.5 |
| 29300160 | 080.0-1010R | 17 | 74.6 – 80 |
| 29300162 | 080.5-1010R | 17 | 75.1 – 80.5 |
| 29300164 | 081.0-1010R | 17 | 75.6 – 81 |
| 29300166 | 081.5-1010R | 17 | 76.1 – 81.5 |
| 29300168 | 082.0-1010R | 17 | 76.6 – 82 |
| 29300170 | 082.5-1010R | 17 | 77.1 – 82.5 |
| 29300172 | 083.0-1010R | 17 | 77.6 – 83 |
| 29300174 | 083.5-1010R | 17 | 78.1 – 83.5 |
| 29300176 | 084.0-1010R | 17 | 78.6 – 84 |
| 29300178 | 084.5-1010R | 17 | 79.1 – 84.5 |
| 29300180 | 085.0-1010R | 17 | 79.6 – 85 |
| 29300182 | 085.5-1010R | 17 | 80.1 – 85.5 |
| 29300184 | 086.0-1010R | 17 | 80.6 – 86 |
| 29300186 | 086.5-1010R | 17 | 81.1 – 86.5 |

The data in this catalog are based on many years experience. They are intended for reference, not as design specifications.

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|----------|-------------|-----------------------|-----------------|
| 29300188 | 087.0-1010R | 17 | 81.6 – 87 |
| 29300190 | 087.5-1010R | 17 | 82.1 – 87.5 |
| 29300192 | 088.0-1010R | 17 | 82.6 – 88 |
| 29300194 | 088.5-1010R | 17 | 83.1 – 88.5 |
| 29300196 | 089.0-1010R | 17 | 83.6 – 89 |
| 29300198 | 089.5-1010R | 17 | 84.1 – 89.5 |
| 29300200 | 090.0-1010R | 17 | 84.6 – 90 |
| 29300202 | 090.5-1010R | 17 | 85.1 – 90.5 |
| 29300204 | 091.0-1010R | 17 | 85.6 – 91 |
| 29300206 | 091.5-1010R | 17 | 86.1 – 91.5 |
| 29300208 | 092.0-1010R | 17 | 86.6 – 92 |
| 29300210 | 092.5-1010R | 17 | 87.1 – 92.5 |
| 29300212 | 093.0-1010R | 17 | 87.6 – 93 |
| 29300214 | 093.5-1010R | 17 | 88.1 – 93.5 |
| 29300216 | 094.0-1010R | 17 | 88.6 – 94 |
| 29300218 | 094.5-1010R | 17 | 89.1 – 94.5 |
| 29300220 | 095.0-1010R | 17 | 89.6 – 95 |
| 29300222 | 095.5-1010R | 17 | 90.1 – 95.5 |
| 29300224 | 096.0-1010R | 17 | 90.6 – 96 |
| 29300226 | 096.5-1010R | 17 | 91.1 – 96.5 |
| 29300228 | 097.0-1010R | 17 | 91.6 – 97 |
| 29300230 | 097.5-1010R | 17 | 92.1 – 97.5 |
| 29300232 | 098.0-1010R | 17 | 92.6 – 98 |
| 29300234 | 098.5-1010R | 17 | 93.1 – 98.5 |
| 29300236 | 099.0-1010R | 17 | 93.6 – 99 |
| 29300238 | 099.5-1010R | 17 | 94.1 – 99.5 |
| 29300240 | 100.0-1010R | 17 | 94.6 – 100 |
| 29300242 | 100.5-1010R | 17 | 95.1 – 100.5 |
| 29300244 | 101.0-1010R | 17 | 95.6 – 101 |
| 29300246 | 101.5-1010R | 17 | 96.1 – 101.5 |
| 29300248 | 102.0-1010R | 17 | 96.6 – 102 |
| 29300250 | 102.5-1010R | 17 | 97.1 – 102.5 |
| 29300252 | 103.0-1010R | 17 | 97.6 – 103 |
| 29300254 | 103.5-1010R | 17 | 98.1 – 103.5 |
| 29300256 | 104.0-1010R | 17 | 98.6 – 104 |
| 29300258 | 104.5-1010R | 17 | 99.1 – 104.5 |
| 29300260 | 105.0-1010R | 17 | 99.6 – 105 |
| 29300262 | 105.5-1010R | 17 | 100.1 – 105.5 |
| 29300264 | 106.0-1010R | 17 | 100.6 – 106 |
| 29300266 | 106.5-1010R | 17 | 101.1 – 106.5 |
| 29300268 | 107.0-1010R | 17 | 101.6 – 107 |
| 29300270 | 107.5-1010R | 17 | 102.1 – 107.5 |
| 29300272 | 108.0-1010R | 17 | 102.6 – 108 |
| 29300274 | 108.5-1010R | 17 | 103.1 – 108.5 |
| 29300276 | 109.0-1010R | 17 | 103.6 – 109 |
| 29300278 | 109.5-1010R | 17 | 104.1 – 109.5 |
| 29300280 | 110.0-1010R | 17 | 104.6 – 110 |
| 29300282 | 110.5-1010R | 17 | 105.1 – 110.5 |
| 29300284 | 111.0-1010R | 17 | 105.6 – 111 |
| 29300286 | 111.5-1010R | 17 | 106.1 – 111.5 |
| 29300288 | 112.0-1010R | 17 | 106.6 – 112 |
| 29300290 | 112.5-1010R | 17 | 107.1 – 112.5 |
| 29300292 | 113.0-1010R | 17 | 107.6 – 113 |
| 29300294 | 113.5-1010R | 17 | 108.1 – 113.5 |
| 29300296 | 114.0-1010R | 17 | 108.6 – 114 |
| 29300298 | 114.5-1010R | 17 | 109.1 – 114.5 |
| 29300300 | 115.0-1010R | 17 | 109.6 – 115 |
| 29300302 | 115.5-1010R | 17 | 110.1 – 115.5 |
| 29300304 | 116.0-1010R | 17 | 110.6 – 116 |
| 29300306 | 116.5-1010R | 17 | 111.1 – 116.5 |
| 29300308 | 117.0-1010R | 17 | 111.6 – 117 |
| 29300310 | 117.5-1010R | 17 | 112.1 – 117.5 |

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|----------|-------------|-----------------------|-----------------|
| 29300312 | 118.0-1010R | 17 | 112.6 – 118 |
| 29300314 | 118.5-1010R | 17 | 113.1 – 118.5 |
| 29300316 | 119.0-1010R | 17 | 113.6 – 119 |
| 29300318 | 119.5-1010R | 17 | 114.1 – 119.5 |
| 29300320 | 120.0-1010R | 17 | 114.6 – 120 |
| 29300322 | 120.5-1010R | 17 | 115.1 – 120.5 |

Assembly Tools

Manual

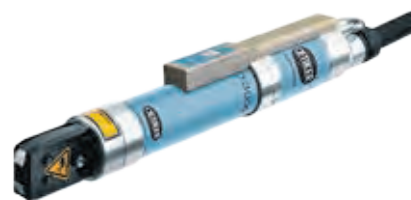
| | |
|-------------------|-------------------|
| Clamping tool 293 | Item No. 14100379 |
| Torque wrench | Item No. 14100098 |



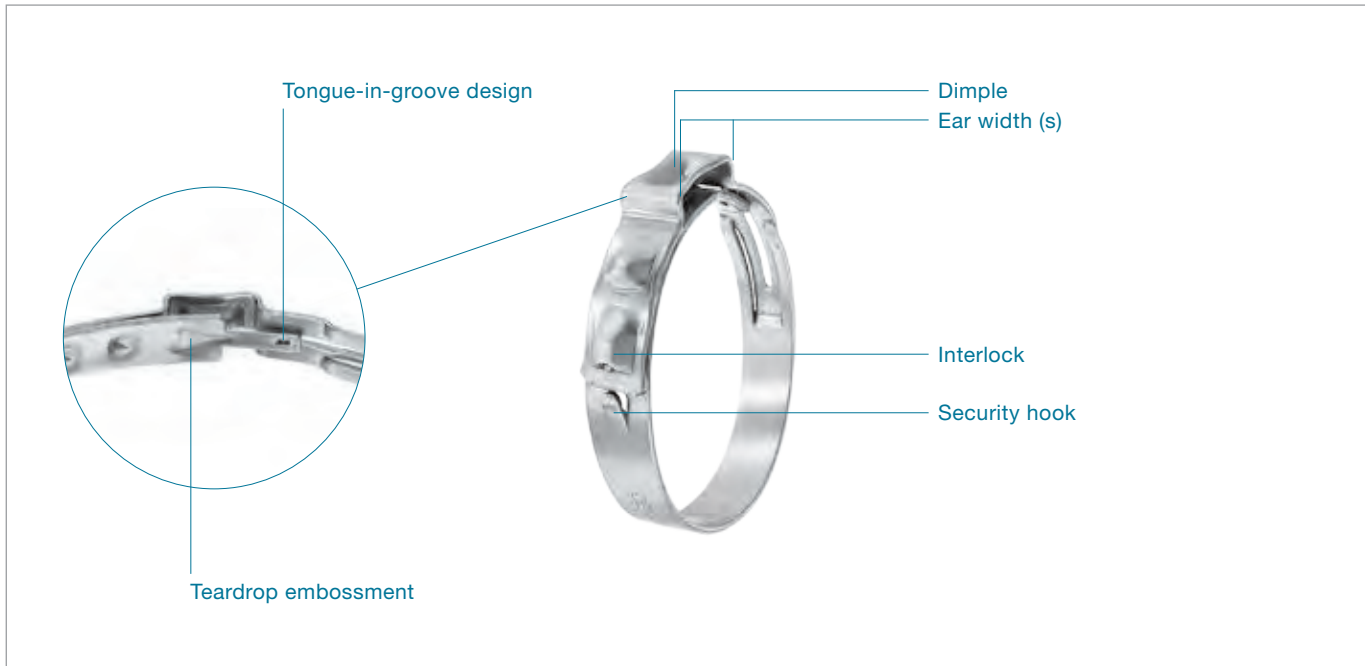
Clamping Tool with Torque Wrench

Mechanical or Electronically controlled

| | |
|--------------------------------------|-------------------|
| HO 7000 ME w/o pincer head* | Item No. 13900230 |
| Pincer head HO-10.5-21.2 ME* | Item No. 13900851 |
| HO 7000 ELT w/o pincer head | Item No. 13900341 |
| Pincer head HO-10.5-21.2 EL | Item No. 13900852 |
| HO 10000 ELT w/o pincer head | Item No. 13900879 |
| Pincer head HO-10.5-21.2 EL HO-10000 | Item No. 13900854 |
| Replacement Jaw Kit | Item No. 13900853 |



* Application specific testing by Oetiker application engineering required



360° StepLess®: uniform compression and uniform surface pressure

Closed interlock: high radial loads, smooth outer contour

Clamp ear: compensates for component tolerances, adjustable surface pressure

Dimple and teardrop embossment: increased clamping force

Burr-free strip edges: reduced risk of damage to parts being clamped

Security hook: prevents unintended opening during transport

StepLess® Ear Clamps – the next generation 123 & 193

Material

123 High strength steel, Material no. 1.0934

Coating: zinc-plated, galfan optional

193 Stainless steel, Material no. 1.4301/UNS S30400

Corrosion resistance according to DIN EN ISO 9227

123 Zinc-plated steel band ≥ 96 h

123 Galvanized steel band ≥ 144 h

193 ≥ 1000 h

Standard Series

| Size range | width x thickness | ear width |
|------------------|-------------------|-----------|
| 18.0 – 120.5 mm* | 7 x 0.6 mm* | 10.7 mm |
| 30.0 – 120.5 mm* | 7 x 0.6 mm* | 13.0 mm |
| 18.0 – 120.5 mm | 7 x 0.8 mm | 10.7 mm |
| 30.0 – 120.5 mm | 7 x 0.8 mm | 13.0 mm |

Heavy Duty Series

| Size range | width x thickness | ear width |
|-------------------|-------------------|-----------|
| 24.5 – 120.5 mm | 10 x 0.8 mm | 10.7 mm |
| 30.0 – 120.5 mm | 10 x 0.8 mm | 13.0 mm |
| 24.5 – 120.5 mm** | 10 x 1.0 mm | 10.7 mm |
| 30.0 – 120.5 mm | 10 x 1.0 mm | 13.0 mm |

* stainless steel available only

** stainless steel material size range starts at 30.0 mm

Sizes

Diameter graduation 0.5 mm

Some sizes are only available if an appropriate minimum quantity is ordered.

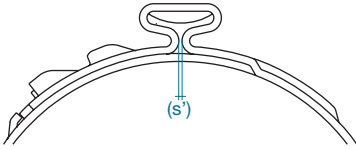
Material dimension

The StepLess® ear clamps are available in standard widths and thicknesses. The band dimensions must be selected so that they take the required radial forces and the hose characteristics into account and secure the necessary sealing and/or retention properties for the corresponding environmental conditions.

Clamp ear (closing element)

Using tools designed or endorsed by Oetiker, the clamp is closed by drawing together the lower radii of the “ear”. The maximum diameter reduction is proportionate to the open “ear” width (s). The theoretical maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{Ear width (s)}}{\pi}$$



Note: the above sketch shows the appearance of a closed “ear” (s’); it does not necessarily indicate an effective closed assembly.

The following applies as a guideline: To determine the correct clamp diameter, push the hose onto the attaching material, (e.g. the nipple), and then measure the outer diameter of the hose. Select a clamp whose average value of the diameter range is slightly greater than the hose’s outer diameter. The clamp is only sufficiently closed (minimal diameter reduction) if the original ear width is reduced by at least 40% (for an ear with a 10.7 mm width) or 50% (for an ear with a 13 mm width) and the correct closing force was applied during assembly.

Block closure

Block closure is when the assembly force fully closes the ear, resulting in both ear legs touching (vertical members between the ear dimple and clamp radius). When this occurs the assembly force is absorbed by compressing the legs rather than transferring the assembly forces to the parts being clamped. If assembly forces are going to be measured, a block closure must be avoided.

Security hook

The standard series will be delivered with security hook. Optionally the clamps can be ordered without security hook.

Assembly Recommendations

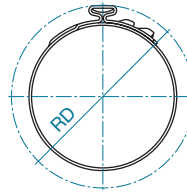
The clamp’s ear should be closed at a uniform rate not exceeding the recommended maximum closing force. This will ensure clamp tension remains constant without overloading individual components of the assembly being joined, and of the clamps. Oetiker calls this assembly method “force priority”. Force priority ensures that tolerance compensating features of the clamp remain functional for every assembly. This ensures the resulting radial force remain approximately the same for every assembly, independent of any component’s dimensional fluctuation. Clamp installation monitoring and process data collection are available by incorporating the “Electronically Controlled Pneumatic Power Tool” Oetiker ELK in the assembly process.

Closing force

As a matter of principle, the closing force selection is closely related to the desired compression or surface pressure of the material to be assembled. The resistance against the clamp corresponds to the applied force, so that the defined closing force is significantly reduced if soft materials are compressed. The maximum closing forces are displayed in the table on the next page, depending on the material dimension. These specifically refer to thermoplastics or other less malleable materials with high Shore hardness.

Rotation diameter

The rotation diameter (RD) of an assembled clamp can be critical design information for applications which require a rotation within a limited open space. It changes, depending on the resulting ear gap. Clamping attempts yield the maximum rotation diameter of the respective component.



Important

- The ear height is a natural result of ear deformation. Do not influence the ear height, either by changing the ear gap or with built-in hold-down devices in assembly tools.
- Single tool stroke closure only, do not apply secondary crimping force.

Assembly data

| Material dimensions (mm) | Size (mm) | Ear width (mm) | Closing force max. (N) | Assembly tools force-monitored ¹ : | | | |
|--------------------------|--------------|----------------|------------------------|---|-------------------|----------|---------------------------|
| | | | | Manual | Pneumatic | Cordless | Electronically controlled |
| 123 | | | | | | | |
| 7 x 0.8 | 18.0 – 120.5 | 10.7 | 2400 | HMK 01/S01 | HO 3000 – 4000 ME | CP 10 | HO 3000 – 4000 EL |
| 7 x 0.8 | 30.0 – 120.5 | 13.0 | 2400 | HMK 01/S01 | HO 3000 – 4000 ME | CP 10 | HO 3000 – 4000 EL |
| 10 x 0.8 | 24.5 – 120.5 | 10.7 | 3400 | Clamping tool and Torque wrench | HO 5000 ME | CP 10 | HO 5000 EL |
| 10 x 0.8 | 30.0 – 120.5 | 13.0 | 3400 | Clamping tool and Torque wrench | HO 5000 ME | CP 10 | HO 5000 EL |
| 10 x 1.0 | 24.5 – 120.5 | 10.7 | 5000 | Clamping tool and Torque wrench | HO 5000 – 7000 ME | CP 20 | HO 5000 – 7000 EL |
| 10 x 1.0 | 30.0 – 120.5 | 13.0 | 5000 | Clamping tool and Torque wrench | HO 5000 – 7000 ME | CP 20 | HO 5000 – 7000 EL |
| 193 | | | | | | | |
| 7 x 0.6 | 18.0 – 120.5 | 10.7 | 2800 | - | HO 3000 – 4000 ME | CP 10 | HO 3000 – 4000 EL |
| 7 x 0.6 | 30.0 – 120.5 | 13.0 | 2600 | HMK 01 | HO 3000 – 4000 ME | CP 10 | HO 3000 – 4000 EL |
| 7 x 0.8 | 18.0 – 120.5 | 10.7 | 4300 | Clamping tool and Torque wrench | HO 5000 ME | CP 20 | HO 5000 EL |
| 7 x 0.8 | 30.0 – 120.5 | 13.0 | 4100 | Clamping tool and Torque wrench | HO 5000 ME | CP 20 | HO 5000 EL |
| 10 x 0.8 | 24.5 – 120.5 | 10.7 | 5600 | Clamping tool and Torque wrench | HO 7000 ME | CP 20 | HO 7000 EL |
| 10 x 0.8 | 30.0 – 120.5 | 13.0 | 5400 | Clamping tool and Torque wrench | HO 7000 ME | CP 20 | HO 7000 EL |
| 10 x 1.0 | 30.0 – 120.5 | 10.7 | 8000 ² | Clamping tool and Torque wrench | HO 7000 ME | CP 20 | HO 7000 – 10000 EL |
| 10 x 1.0 | 30.0 – 120.5 | 13.0 | 7700 ² | Clamping tool and Torque wrench | HO 7000 ME | CP 20 | HO 7000 – 10000 EL |

For an alternative option, see our manual pincers on page 130

¹ Further information on page 108

² For closing forces ≥ 7000 N, with the HO 7000, an inlet pressure of > 5.5 bar is required.

Important note

These figures are intended as a guide, they may vary depending on the type and tolerances of parts being clamped. To ensure optimum clamp selection, we recommend making functional tests with several assemblies.

Order information 123

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|-----------|-----------------------|-----------------|
| High strength steel, coating: zinc-plated Band width 7 mm, thickness 0.8 mm (708) | | | |
| 12300898 | 018.0-708 | 10.7 | 14.6 – 18 |
| 12300899 | 018.5-708 | 10.7 | 15.1 – 18.5 |
| 12300900 | 019.0-708 | 10.7 | 15.6 – 19 |
| 12300901 | 019.5-708 | 10.7 | 16.1 – 19.5 |
| 12300902 | 020.0-708 | 10.7 | 16.6 – 20 |
| 12300903 | 020.5-708 | 10.7 | 17.1 – 20.5 |
| 12300841 | 021.0-708 | 10.7 | 17.6 – 21 |
| 12300904 | 021.5-708 | 10.7 | 18.1 – 21.5 |
| 12300905 | 022.0-708 | 10.7 | 18.6 – 22 |
| 12300842 | 022.5-708 | 10.7 | 19.1 – 22.5 |
| 12300906 | 023.0-708 | 10.7 | 19.6 – 23 |
| 12300907 | 023.5-708 | 10.7 | 20.1 – 23.5 |
| 12300908 | 024.0-708 | 10.7 | 20.6 – 24 |
| 12300909 | 024.5-708 | 10.7 | 21.1 – 24.5 |
| 12300589 | 025.0-708 | 10.7 | 21.6 – 25 |
| 12300642 | 025.5-708 | 10.7 | 22.1 – 25.5 |
| 12300643 | 026.0-708 | 10.7 | 22.6 – 26 |
| 12300644 | 026.5-708 | 10.7 | 23.1 – 26.5 |
| 12300645 | 027.0-708 | 10.7 | 23.6 – 27 |
| 12300646 | 027.5-708 | 10.7 | 24.1 – 27.5 |
| 12300647 | 028.0-708 | 10.7 | 24.6 – 28 |
| 12300648 | 028.5-708 | 10.7 | 25.1 – 28.5 |
| 12300649 | 029.0-708 | 10.7 | 25.6 – 29 |
| 12300650 | 029.5-708 | 10.7 | 26.1 – 29.5 |
| 12300590 | 030.0-708 | 10.7 | 26.6 – 30 |
| 12300651 | 030.5-708 | 10.7 | 27.1 – 30.5 |
| 12300652 | 031.0-708 | 10.7 | 27.6 – 31 |
| 12300653 | 031.5-708 | 10.7 | 28.1 – 31.5 |
| 12300654 | 032.0-708 | 10.7 | 28.6 – 32 |
| 12300655 | 032.5-708 | 10.7 | 29.1 – 32.5 |
| 12300627 | 033.0-708 | 10.7 | 29.6 – 33 |
| 12300656 | 033.5-708 | 10.7 | 30.1 – 33.5 |
| 12300657 | 034.0-708 | 10.7 | 30.6 – 34 |
| 12300658 | 034.5-708 | 10.7 | 31.1 – 34.5 |
| 12300659 | 035.0-708 | 10.7 | 31.6 – 35 |
| 12300660 | 035.5-708 | 10.7 | 32.1 – 35.5 |
| 12300661 | 036.0-708 | 10.7 | 32.6 – 36 |
| 12300662 | 036.5-708 | 10.7 | 33.1 – 36.5 |
| 12300663 | 037.0-708 | 10.7 | 33.6 – 37 |
| 12300664 | 037.5-708 | 10.7 | 34.1 – 37.5 |
| 12300665 | 038.0-708 | 10.7 | 34.6 – 38 |
| 12300666 | 038.5-708 | 10.7 | 35.1 – 38.5 |
| 12300641 | 039.0-708 | 10.7 | 35.6 – 39 |
| 12300668 | 039.5-708 | 10.7 | 36.1 – 39.5 |
| 12300669 | 040.0-708 | 10.7 | 36.6 – 40 |
| 12300670 | 040.5-708 | 10.7 | 37.1 – 40.5 |
| 12300671 | 041.0-708 | 10.7 | 37.6 – 41 |
| 12300672 | 041.5-708 | 10.7 | 38.1 – 41.5 |
| 12300673 | 042.0-708 | 10.7 | 38.6 – 42 |
| 12300674 | 042.5-708 | 10.7 | 39.1 – 42.5 |
| 12300675 | 043.0-708 | 10.7 | 39.6 – 43 |
| 12300676 | 043.5-708 | 10.7 | 40.1 – 43.5 |
| 12300677 | 044.0-708 | 10.7 | 40.6 – 44 |
| 12300678 | 044.5-708 | 10.7 | 41.1 – 44.5 |
| 12300679 | 045.0-708 | 10.7 | 41.6 – 45 |
| 12300680 | 045.5-708 | 10.7 | 42.1 – 45.5 |
| 12300681 | 046.0-708 | 10.7 | 42.6 – 46 |

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|-----------|-----------------------|-----------------|
| High strength steel, coating: zinc-plated Band width 7 mm, thickness 0.8 mm (708) | | | |
| 12300682 | 046.5-708 | 10.7 | 43.1 – 46.5 |
| 12300683 | 047.0-708 | 10.7 | 43.6 – 47 |
| 12300684 | 047.5-708 | 10.7 | 44.1 – 47.5 |
| 12300685 | 048.0-708 | 10.7 | 44.6 – 48 |
| 12300686 | 048.5-708 | 10.7 | 45.1 – 48.5 |
| 12300687 | 049.0-708 | 10.7 | 45.6 – 49 |
| 12300688 | 049.5-708 | 10.7 | 46.1 – 49.5 |
| 12300689 | 050.0-708 | 10.7 | 46.6 – 50 |
| 12300690 | 050.5-708 | 10.7 | 47.1 – 50.5 |
| 12300691 | 051.0-708 | 10.7 | 47.6 – 51 |
| 12300632 | 051.5-708 | 10.7 | 48.1 – 51.5 |
| 12300692 | 052.0-708 | 10.7 | 48.6 – 52 |
| 12300693 | 052.5-708 | 10.7 | 49.1 – 52.5 |
| 12300694 | 053.0-708 | 10.7 | 49.6 – 53 |
| 12300695 | 053.5-708 | 10.7 | 50.1 – 53.5 |
| 12300696 | 054.0-708 | 10.7 | 50.6 – 54 |
| 12300697 | 054.5-708 | 10.7 | 51.1 – 54.5 |
| 12300698 | 055.0-708 | 10.7 | 51.6 – 55 |
| 12300699 | 055.5-708 | 10.7 | 52.1 – 55.5 |
| 12300700 | 056.0-708 | 10.7 | 52.6 – 56 |
| 12300701 | 056.5-708 | 10.7 | 53.1 – 56.5 |
| 12300702 | 057.0-708 | 10.7 | 53.6 – 57 |
| 12300703 | 057.5-708 | 10.7 | 54.1 – 57.5 |
| 12300704 | 058.0-708 | 10.7 | 54.6 – 58 |
| 12300705 | 058.5-708 | 10.7 | 55.1 – 58.5 |
| 12300706 | 059.0-708 | 10.7 | 55.6 – 59 |
| 12300707 | 059.5-708 | 10.7 | 56.1 – 59.5 |
| 12300591 | 060.0-708 | 10.7 | 56.6 – 60 |
| 12300708 | 060.5-708 | 10.7 | 57.1 – 60.5 |
| 12300709 | 061.0-708 | 10.7 | 57.6 – 61 |
| 12300710 | 061.5-708 | 10.7 | 58.1 – 61.5 |
| 12300711 | 062.0-708 | 10.7 | 58.6 – 62 |
| 12300712 | 062.5-708 | 10.7 | 59.1 – 62.5 |
| 12300713 | 063.0-708 | 10.7 | 59.6 – 63 |
| 12300714 | 063.5-708 | 10.7 | 60.1 – 63.5 |
| 12300715 | 064.0-708 | 10.7 | 60.6 – 64 |
| 12300716 | 064.5-708 | 10.7 | 61.1 – 64.5 |
| 12300717 | 065.0-708 | 10.7 | 61.6 – 65 |
| 12300718 | 065.5-708 | 10.7 | 62.1 – 65.5 |
| 12300719 | 066.0-708 | 10.7 | 62.6 – 66 |
| 12300720 | 066.5-708 | 10.7 | 63.1 – 66.5 |
| 12300721 | 067.0-708 | 10.7 | 63.6 – 67 |
| 12300722 | 067.5-708 | 10.7 | 64.1 – 67.5 |
| 12300723 | 068.0-708 | 10.7 | 64.6 – 68 |
| 12300724 | 068.5-708 | 10.7 | 65.1 – 68.5 |
| 12300725 | 069.0-708 | 10.7 | 65.6 – 69 |
| 12300726 | 069.5-708 | 10.7 | 66.1 – 69.5 |
| 12300727 | 070.0-708 | 10.7 | 66.6 – 70 |
| 12300728 | 070.5-708 | 10.7 | 67.1 – 70.5 |
| 12300729 | 071.0-708 | 10.7 | 67.6 – 71 |
| 12300730 | 071.5-708 | 10.7 | 68.1 – 71.5 |
| 12300731 | 072.0-708 | 10.7 | 68.6 – 72 |
| 12300732 | 072.5-708 | 10.7 | 69.1 – 72.5 |
| 12300733 | 073.0-708 | 10.7 | 69.6 – 73 |
| 12300734 | 073.5-708 | 10.7 | 70.1 – 73.5 |
| 12300735 | 074.0-708 | 10.7 | 70.6 – 74 |
| 12300736 | 074.5-708 | 10.7 | 71.1 – 74.5 |

Order information 123

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|-----------|-----------------------|-----------------|
| High strength steel, coating: zinc-plated Band width 7 mm, thickness 0.8 mm (708) | | | |
| 12300737 | 075.0-708 | 10.7 | 71.6 – 75 |
| 12300738 | 075.5-708 | 10.7 | 72.1 – 75.5 |
| 12300739 | 076.0-708 | 10.7 | 72.6 – 76 |
| 12300740 | 076.5-708 | 10.7 | 73.1 – 76.5 |
| 12300741 | 077.0-708 | 10.7 | 73.6 – 77 |
| 12300742 | 077.5-708 | 10.7 | 74.1 – 77.5 |
| 12300743 | 078.0-708 | 10.7 | 74.6 – 78 |
| 12300744 | 078.5-708 | 10.7 | 75.1 – 78.5 |
| 12300745 | 079.0-708 | 10.7 | 75.6 – 79 |
| 12300746 | 079.5-708 | 10.7 | 76.1 – 79.5 |
| 12300747 | 080.0-708 | 10.7 | 76.6 – 80 |
| 12300748 | 080.5-708 | 10.7 | 77.1 – 80.5 |
| 12300749 | 081.0-708 | 10.7 | 77.6 – 81 |
| 12300750 | 081.5-708 | 10.7 | 78.1 – 81.5 |
| 12300751 | 082.0-708 | 10.7 | 78.6 – 82 |
| 12300752 | 082.5-708 | 10.7 | 79.1 – 82.5 |
| 12300753 | 083.0-708 | 10.7 | 79.6 – 83 |
| 12300754 | 083.5-708 | 10.7 | 80.1 – 83.5 |
| 12300755 | 084.0-708 | 10.7 | 80.6 – 84 |
| 12300756 | 084.5-708 | 10.7 | 81.1 – 84.5 |
| 12300757 | 085.0-708 | 10.7 | 81.6 – 85 |
| 12300758 | 085.5-708 | 10.7 | 82.1 – 85.5 |
| 12300759 | 086.0-708 | 10.7 | 82.6 – 86 |
| 12300760 | 086.5-708 | 10.7 | 83.1 – 86.5 |
| 12300761 | 087.0-708 | 10.7 | 83.6 – 87 |
| 12300762 | 087.5-708 | 10.7 | 84.1 – 87.5 |
| 12300763 | 088.0-708 | 10.7 | 84.6 – 88 |
| 12300764 | 088.5-708 | 10.7 | 85.1 – 88.5 |
| 12300765 | 089.0-708 | 10.7 | 85.6 – 89 |
| 12300766 | 089.5-708 | 10.7 | 86.1 – 89.5 |
| 12300767 | 090.0-708 | 10.7 | 86.6 – 90 |
| 12300768 | 090.5-708 | 10.7 | 87.1 – 90.5 |
| 12300769 | 091.0-708 | 10.7 | 87.6 – 91 |
| 12300770 | 091.5-708 | 10.7 | 88.1 – 91.5 |
| 12300771 | 092.0-708 | 10.7 | 88.6 – 92 |
| 12300772 | 092.5-708 | 10.7 | 89.1 – 92.5 |
| 12300773 | 093.0-708 | 10.7 | 89.6 – 93 |
| 12300774 | 093.5-708 | 10.7 | 90.1 – 93.5 |
| 12300775 | 094.0-708 | 10.7 | 90.6 – 94 |
| 12300776 | 094.5-708 | 10.7 | 91.1 – 94.5 |
| 12300777 | 095.0-708 | 10.7 | 91.6 – 95 |
| 12300778 | 095.5-708 | 10.7 | 92.1 – 95.5 |
| 12300779 | 096.0-708 | 10.7 | 92.6 – 96 |
| 12300780 | 096.5-708 | 10.7 | 93.1 – 96.5 |
| 12300781 | 097.0-708 | 10.7 | 93.6 – 97 |
| 12300782 | 097.5-708 | 10.7 | 94.1 – 97.5 |
| 12300783 | 098.0-708 | 10.7 | 94.6 – 98 |
| 12300784 | 098.5-708 | 10.7 | 95.1 – 98.5 |
| 12300785 | 099.0-708 | 10.7 | 95.6 – 99 |
| 12300786 | 099.5-708 | 10.7 | 96.1 – 99.5 |
| 12300787 | 100.0-708 | 10.7 | 96.6 – 100 |
| 12300788 | 100.5-708 | 10.7 | 97.1 – 100.5 |
| 12300789 | 101.0-708 | 10.7 | 97.6 – 101 |
| 12300790 | 101.5-708 | 10.7 | 98.1 – 101.5 |
| 12300791 | 102.0-708 | 10.7 | 98.6 – 102 |
| 12300792 | 102.5-708 | 10.7 | 99.1 – 102.5 |

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|-----------|-----------------------|-----------------|
| High strength steel, coating: zinc-plated Band width 7 mm, thickness 0.8 mm (708) | | | |
| 12300793 | 103.0-708 | 10.7 | 99.6 – 103 |
| 12300794 | 103.5-708 | 10.7 | 100.1 – 103.5 |
| 12300795 | 104.0-708 | 10.7 | 100.6 – 104 |
| 12300796 | 104.5-708 | 10.7 | 101.1 – 104.5 |
| 12300797 | 105.0-708 | 10.7 | 101.6 – 105 |
| 12300798 | 105.5-708 | 10.7 | 102.1 – 105.5 |
| 12300799 | 106.0-708 | 10.7 | 102.6 – 106 |
| 12300800 | 106.5-708 | 10.7 | 103.1 – 106.5 |
| 12300801 | 107.0-708 | 10.7 | 103.6 – 107 |
| 12300802 | 107.5-708 | 10.7 | 104.1 – 107.5 |
| 12300803 | 108.0-708 | 10.7 | 104.6 – 108 |
| 12300804 | 108.5-708 | 10.7 | 105.1 – 108.5 |
| 12300805 | 109.0-708 | 10.7 | 105.6 – 109 |
| 12300806 | 109.5-708 | 10.7 | 106.1 – 109.5 |
| 12300807 | 110.0-708 | 10.7 | 106.6 – 110 |
| 12300808 | 110.5-708 | 10.7 | 107.1 – 110.5 |
| 12300809 | 111.0-708 | 10.7 | 107.6 – 111 |
| 12300810 | 111.5-708 | 10.7 | 108.1 – 111.5 |
| 12300811 | 112.0-708 | 10.7 | 108.6 – 112 |
| 12300812 | 112.5-708 | 10.7 | 109.1 – 112.5 |
| 12300813 | 113.0-708 | 10.7 | 109.6 – 113 |
| 12300814 | 113.5-708 | 10.7 | 110.1 – 113.5 |
| 12300815 | 114.0-708 | 10.7 | 110.6 – 114 |
| 12300816 | 114.5-708 | 10.7 | 111.1 – 114.5 |
| 12300817 | 115.0-708 | 10.7 | 111.6 – 115 |
| 12300818 | 115.5-708 | 10.7 | 112.1 – 115.5 |
| 12300819 | 116.0-708 | 10.7 | 112.6 – 116 |
| 12300820 | 116.5-708 | 10.7 | 113.1 – 116.5 |
| 12300821 | 117.0-708 | 10.7 | 113.6 – 117 |
| 12300822 | 117.5-708 | 10.7 | 114.1 – 117.5 |
| 12300823 | 118.0-708 | 10.7 | 114.6 – 118 |
| 12300824 | 118.5-708 | 10.7 | 115.1 – 118.5 |
| 12300825 | 119.0-708 | 10.7 | 115.6 – 119 |
| 12300826 | 119.5-708 | 10.7 | 116.1 – 119.5 |
| 12300827 | 120.0-708 | 10.7 | 116.6 – 120 |
| 12300592 | 120.5-708 | 10.7 | 117.1 – 120.5 |

Available on request
(Diameter graduation 0.5 mm)

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|---|----------|-----------------------|-----------------|
| Band width 7 mm, thickness 0.8 mm (708) | | | |
| On request | | 13 | 30.0 ... 120.5 |
| Band width 10 mm, thickness 0.8 mm (1008) | | | |
| On request | | 10.7 | 24.5 ... 120.5 |
| On request | | 13 | 30.0 ... 120.5 |
| Band width 10 mm, thickness 1.0 mm (1010) | | | |
| On request | | 10.7 | 24.5 ... 120.5 |
| On request | | 13 | 30.0 ... 120.5 |

Order information 193

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|------------|-----------------------|-----------------|
| Band width 7 mm, thickness 0.6 mm (706R) | | | |
| 19300111 | 018.0-706R | 10.7 | 14.6 – 18 |
| 19300838 | 018.5-706R | 10.7 | 15.1 – 18.5 |
| 19300916 | 019.0-706R | 10.7 | 15.6 – 19 |
| 19300917 | 019.5-706R | 10.7 | 16.1 – 19.5 |
| 19300373 | 020.0-706R | 10.7 | 16.6 – 20 |
| 19300776 | 020.5-706R | 10.7 | 17.1 – 20.5 |
| 19300778 | 021.0-706R | 10.7 | 17.6 – 21 |
| 19300918 | 021.5-706R | 10.7 | 18.1 – 21.5 |
| 19300853 | 022.0-706R | 10.7 | 18.6 – 22 |
| 19300105 | 022.5-706R | 10.7 | 19.1 – 22.5 |
| 19300919 | 023.0-706R | 10.7 | 19.6 – 23 |
| 19300823 | 023.5-706R | 10.7 | 20.1 – 23.5 |
| 19300900 | 024.0-706R | 10.7 | 20.6 – 24 |
| 19300765 | 024.5-706R | 10.7 | 21.1 – 24.5 |
| 19300705 | 024.9-706R | 10.7 | 21.5 – 24.9 |
| 19300116 | 025.0-706R | 10.7 | 21.6 – 25 |
| 19300487 | 025.5-706R | 10.7 | 22.1 – 25.5 |
| 19300488 | 026.0-706R | 10.7 | 22.6 – 26 |
| 19300489 | 026.5-706R | 10.7 | 23.1 – 26.5 |
| 19300368 | 027.0-706R | 10.7 | 23.6 – 27 |
| 19300491 | 027.5-706R | 10.7 | 24.1 – 27.5 |
| 19300492 | 028.0-706R | 10.7 | 24.6 – 28 |
| 19300493 | 028.5-706R | 10.7 | 25.1 – 28.5 |
| 19300494 | 029.0-706R | 10.7 | 25.6 – 29 |
| 19300495 | 029.5-706R | 10.7 | 26.1 – 29.5 |
| 19300354 | 030.0-706R | 10.7 | 26.6 – 30 |
| 19300497 | 030.5-706R | 10.7 | 27.1 – 30.5 |
| 19300498 | 031.0-706R | 10.7 | 27.6 – 31 |
| 19300472 | 031.5-706R | 10.7 | 28.1 – 31.5 |
| 19300500 | 032.0-706R | 10.7 | 28.6 – 32 |
| 19300501 | 032.5-706R | 10.7 | 29.1 – 32.5 |
| 19300502 | 033.0-706R | 10.7 | 29.6 – 33 |
| 19300503 | 033.5-706R | 10.7 | 30.1 – 33.5 |
| 19300504 | 034.0-706R | 10.7 | 30.6 – 34 |
| 19300505 | 034.5-706R | 10.7 | 31.1 – 34.5 |
| 19300506 | 035.0-706R | 10.7 | 31.6 – 35 |
| 19300507 | 035.5-706R | 10.7 | 32.1 – 35.5 |
| 19300508 | 036.0-706R | 10.7 | 32.6 – 36 |
| 19300509 | 036.5-706R | 10.7 | 33.1 – 36.5 |
| 19300510 | 037.0-706R | 10.7 | 33.6 – 37 |
| 19300511 | 037.5-706R | 10.7 | 34.1 – 37.5 |
| 19300512 | 038.0-706R | 10.7 | 34.6 – 38 |
| 19300513 | 038.5-706R | 10.7 | 35.1 – 38.5 |
| 19300514 | 039.0-706R | 10.7 | 35.6 – 39 |
| 19300515 | 039.5-706R | 10.7 | 36.1 – 39.5 |
| 19300348 | 040.0-706R | 10.7 | 36.6 – 40 |
| 19300516 | 040.5-706R | 10.7 | 37.1 – 40.5 |
| 19300517 | 041.0-706R | 10.7 | 37.6 – 41 |
| 19300518 | 041.5-706R | 10.7 | 38.1 – 41.5 |
| 19300519 | 042.0-706R | 10.7 | 38.6 – 42 |
| 19300520 | 042.5-706R | 10.7 | 39.1 – 42.5 |
| 19300349 | 043.0-706R | 10.7 | 39.6 – 43 |
| 19300521 | 043.5-706R | 10.7 | 40.1 – 43.5 |
| 19300522 | 044.0-706R | 10.7 | 40.6 – 44 |
| 19300523 | 044.5-706R | 10.7 | 41.1 – 44.5 |
| 19300524 | 045.0-706R | 10.7 | 41.6 – 45 |
| 19300525 | 045.5-706R | 10.7 | 42.1 – 45.5 |
| 19300526 | 046.0-706R | 10.7 | 42.6 – 46 |

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|------------|-----------------------|-----------------|
| Band width 7 mm, thickness 0.6 mm (706R) | | | |
| 19300527 | 046.5-706R | 10.7 | 43.1 – 46.5 |
| 19300528 | 047.0-706R | 10.7 | 43.6 – 47 |
| 19300529 | 047.5-706R | 10.7 | 44.1 – 47.5 |
| 19300530 | 048.0-706R | 10.7 | 44.6 – 48 |
| 19300531 | 048.5-706R | 10.7 | 45.1 – 48.5 |
| 19300532 | 049.0-706R | 10.7 | 45.6 – 49 |
| 19300533 | 049.5-706R | 10.7 | 46.1 – 49.5 |
| 19300534 | 050.0-706R | 10.7 | 46.6 – 50 |
| 19300535 | 050.5-706R | 10.7 | 47.1 – 50.5 |
| 19300536 | 051.0-706R | 10.7 | 47.6 – 51 |
| 19300537 | 051.5-706R | 10.7 | 48.1 – 51.5 |
| 19300538 | 052.0-706R | 10.7 | 48.6 – 52 |
| 19300539 | 052.5-706R | 10.7 | 49.1 – 52.5 |
| 19300540 | 053.0-706R | 10.7 | 49.6 – 53 |
| 19300541 | 053.5-706R | 10.7 | 50.1 – 53.5 |
| 19300542 | 054.0-706R | 10.7 | 50.6 – 54 |
| 19300543 | 054.5-706R | 10.7 | 51.1 – 54.5 |
| 19300544 | 055.0-706R | 10.7 | 51.6 – 55 |
| 19300545 | 055.5-706R | 10.7 | 52.1 – 55.5 |
| 19300546 | 056.0-706R | 10.7 | 52.6 – 56 |
| 19300547 | 056.5-706R | 10.7 | 53.1 – 56.5 |
| 19300548 | 057.0-706R | 10.7 | 53.6 – 57 |
| 19300549 | 057.5-706R | 10.7 | 54.1 – 57.5 |
| 19300550 | 058.0-706R | 10.7 | 54.6 – 58 |
| 19300551 | 058.5-706R | 10.7 | 55.1 – 58.5 |
| 19300552 | 059.0-706R | 10.7 | 55.6 – 59 |
| 19300553 | 059.5-706R | 10.7 | 56.1 – 59.5 |
| 19300114 | 060.0-706R | 10.7 | 56.6 – 60 |
| 19300490 | 060.5-706R | 10.7 | 57.1 – 60.5 |
| 19300496 | 061.0-706R | 10.7 | 57.6 – 61 |
| 19300499 | 061.5-706R | 10.7 | 58.1 – 61.5 |
| 19300554 | 062.0-706R | 10.7 | 58.6 – 62 |
| 19300555 | 062.5-706R | 10.7 | 59.1 – 62.5 |
| 19300556 | 063.0-706R | 10.7 | 59.6 – 63 |
| 19300557 | 063.5-706R | 10.7 | 60.1 – 63.5 |
| 19300558 | 064.0-706R | 10.7 | 60.6 – 64 |
| 19300559 | 064.5-706R | 10.7 | 61.1 – 64.5 |
| 19300560 | 065.0-706R | 10.7 | 61.6 – 65 |
| 19300561 | 065.5-706R | 10.7 | 62.1 – 65.5 |
| 19300562 | 066.0-706R | 10.7 | 62.6 – 66 |
| 19300563 | 066.5-706R | 10.7 | 63.1 – 66.5 |
| 19300564 | 067.0-706R | 10.7 | 63.6 – 67 |
| 19300565 | 067.5-706R | 10.7 | 64.1 – 67.5 |
| 19300476 | 068.0-706R | 10.7 | 64.6 – 68 |
| 19300566 | 068.5-706R | 10.7 | 65.1 – 68.5 |
| 19300567 | 069.0-706R | 10.7 | 65.6 – 69 |
| 19300568 | 069.5-706R | 10.7 | 66.1 – 69.5 |
| 19300569 | 070.0-706R | 10.7 | 66.6 – 70 |
| 19300570 | 070.5-706R | 10.7 | 67.1 – 70.5 |
| 19300571 | 071.0-706R | 10.7 | 67.6 – 71 |
| 19300572 | 071.5-706R | 10.7 | 68.1 – 71.5 |
| 19300573 | 072.0-706R | 10.7 | 68.6 – 72 |
| 19300574 | 072.5-706R | 10.7 | 69.1 – 72.5 |
| 19300575 | 073.0-706R | 10.7 | 69.6 – 73 |
| 19300576 | 073.5-706R | 10.7 | 70.1 – 73.5 |
| 19300577 | 074.0-706R | 10.7 | 70.6 – 74 |
| 19300578 | 074.5-706R | 10.7 | 71.1 – 74.5 |
| 19300579 | 075.0-706R | 10.7 | 71.6 – 75 |

Order information 193

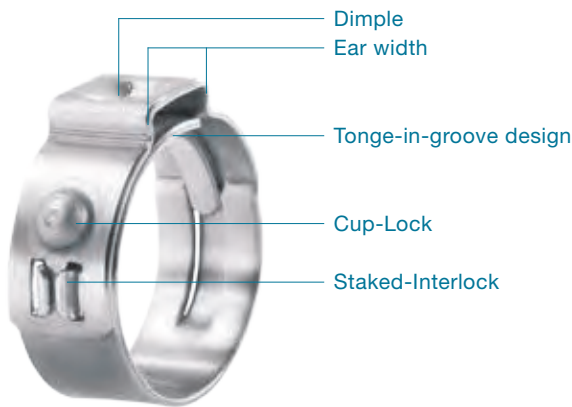
| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|------------|-----------------------|-----------------|
| Band width 7 mm, thickness 0.6 mm (706R) | | | |
| 19300580 | 075.5-706R | 10.7 | 72.1 – 75.5 |
| 19300581 | 076.0-706R | 10.7 | 72.6 – 76 |
| 19300582 | 076.5-706R | 10.7 | 73.1 – 76.5 |
| 19300583 | 077.0-706R | 10.7 | 73.6 – 77 |
| 19300584 | 077.5-706R | 10.7 | 74.1 – 77.5 |
| 19300585 | 078.0-706R | 10.7 | 74.6 – 78 |
| 19300586 | 078.5-706R | 10.7 | 75.1 – 78.5 |
| 19300587 | 079.0-706R | 10.7 | 75.6 – 79 |
| 19300588 | 079.5-706R | 10.7 | 76.1 – 79.5 |
| 19300589 | 080.0-706R | 10.7 | 76.6 – 80 |
| 19300590 | 080.5-706R | 10.7 | 77.1 – 80.5 |
| 19300591 | 081.0-706R | 10.7 | 77.6 – 81 |
| 19300592 | 081.5-706R | 10.7 | 78.1 – 81.5 |
| 19300593 | 082.0-706R | 10.7 | 78.6 – 82 |
| 19300594 | 082.5-706R | 10.7 | 79.1 – 82.5 |
| 19300595 | 083.0-706R | 10.7 | 79.6 – 83 |
| 19300596 | 083.5-706R | 10.7 | 80.1 – 83.5 |
| 19300597 | 084.0-706R | 10.7 | 80.6 – 84 |
| 19300598 | 084.5-706R | 10.7 | 81.1 – 84.5 |
| 19300599 | 085.0-706R | 10.7 | 81.6 – 85 |
| 19300600 | 085.5-706R | 10.7 | 82.1 – 85.5 |
| 19300601 | 086.0-706R | 10.7 | 82.6 – 86 |
| 19300602 | 086.5-706R | 10.7 | 83.1 – 86.5 |
| 19300603 | 087.0-706R | 10.7 | 83.6 – 87 |
| 19300604 | 087.5-706R | 10.7 | 84.1 – 87.5 |
| 19300605 | 088.0-706R | 10.7 | 84.6 – 88 |
| 19300606 | 088.5-706R | 10.7 | 85.1 – 88.5 |
| 19300607 | 089.0-706R | 10.7 | 85.6 – 89 |
| 19300608 | 089.5-706R | 10.7 | 86.1 – 89.5 |
| 19300609 | 090.0-706R | 10.7 | 86.6 – 90 |
| 19300610 | 090.5-706R | 10.7 | 87.1 – 90.5 |
| 19300611 | 091.0-706R | 10.7 | 87.6 – 91 |
| 19300612 | 091.5-706R | 10.7 | 88.1 – 91.5 |
| 19300613 | 092.0-706R | 10.7 | 88.6 – 92 |
| 19300614 | 092.5-706R | 10.7 | 89.1 – 92.5 |
| 19300615 | 093.0-706R | 10.7 | 89.6 – 93 |
| 19300616 | 093.5-706R | 10.7 | 90.1 – 93.5 |
| 19300617 | 094.0-706R | 10.7 | 90.6 – 94 |
| 19300618 | 094.5-706R | 10.7 | 91.1 – 94.5 |
| 19300619 | 095.0-706R | 10.7 | 91.6 – 95 |
| 19300620 | 095.5-706R | 10.7 | 92.1 – 95.5 |
| 19300621 | 096.0-706R | 10.7 | 92.6 – 96 |
| 19300622 | 096.5-706R | 10.7 | 93.1 – 96.5 |
| 19300623 | 097.0-706R | 10.7 | 93.6 – 97 |
| 19300624 | 097.5-706R | 10.7 | 94.1 – 97.5 |
| 19300625 | 098.0-706R | 10.7 | 94.6 – 98 |
| 19300626 | 098.5-706R | 10.7 | 95.1 – 98.5 |
| 19300627 | 099.0-706R | 10.7 | 95.6 – 99 |
| 19300628 | 099.5-706R | 10.7 | 96.1 – 99.5 |
| 19300629 | 100.0-706R | 10.7 | 96.6 – 100 |
| 19300630 | 100.5-706R | 10.7 | 97.1 – 100.5 |
| 19300631 | 101.0-706R | 10.7 | 97.6 – 101 |
| 19300632 | 101.5-706R | 10.7 | 98.1 – 101.5 |
| 19300633 | 102.0-706R | 10.7 | 98.6 – 102 |
| 19300634 | 102.5-706R | 10.7 | 99.1 – 102.5 |
| 19300635 | 103.0-706R | 10.7 | 99.6 – 103 |
| 19300636 | 103.5-706R | 10.7 | 100.1 – 103.5 |
| 19300637 | 104.0-706R | 10.7 | 100.6 – 104 |

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|------------|-----------------------|-----------------|
| Band width 7 mm, thickness 0.6 mm (706R) | | | |
| 19300638 | 104.5-706R | 10.7 | 101.1 – 104.5 |
| 19300639 | 105.0-706R | 10.7 | 101.6 – 105 |
| 19300640 | 105.5-706R | 10.7 | 102.1 – 105.5 |
| 19300641 | 106.0-706R | 10.7 | 102.6 – 106 |
| 19300642 | 106.5-706R | 10.7 | 103.1 – 106.5 |
| 19300643 | 107.0-706R | 10.7 | 103.6 – 107 |
| 19300644 | 107.5-706R | 10.7 | 104.1 – 107.5 |
| 19300645 | 108.0-706R | 10.7 | 104.6 – 108 |
| 19300646 | 108.5-706R | 10.7 | 105.1 – 108.5 |
| 19300647 | 109.0-706R | 10.7 | 105.6 – 109 |
| 19300648 | 109.5-706R | 10.7 | 106.1 – 109.5 |
| 19300649 | 110.0-706R | 10.7 | 106.6 – 110 |
| 19300650 | 110.5-706R | 10.7 | 107.1 – 110.5 |
| 19300651 | 111.0-706R | 10.7 | 107.6 – 111 |
| 19300652 | 111.5-706R | 10.7 | 108.1 – 111.5 |
| 19300653 | 112.0-706R | 10.7 | 108.6 – 112 |
| 19300654 | 112.5-706R | 10.7 | 109.1 – 112.5 |
| 19300655 | 113.0-706R | 10.7 | 109.6 – 113 |
| 19300656 | 113.5-706R | 10.7 | 110.1 – 113.5 |
| 19300657 | 114.0-706R | 10.7 | 110.6 – 114 |
| 19300658 | 114.5-706R | 10.7 | 111.1 – 114.5 |
| 19300659 | 115.0-706R | 10.7 | 111.6 – 115 |
| 19300660 | 115.5-706R | 10.7 | 112.1 – 115.5 |
| 19300661 | 116.0-706R | 10.7 | 112.6 – 116 |
| 19300662 | 116.5-706R | 10.7 | 113.1 – 116.5 |
| 19300663 | 117.0-706R | 10.7 | 113.6 – 117 |
| 19300664 | 117.5-706R | 10.7 | 114.1 – 117.5 |
| 19300665 | 118.0-706R | 10.7 | 114.6 – 118 |
| 19300666 | 118.5-706R | 10.7 | 115.1 – 118.5 |
| 19300667 | 119.0-706R | 10.7 | 115.6 – 119 |
| 19300668 | 119.5-706R | 10.7 | 116.1 – 119.5 |
| 19300669 | 120.0-706R | 10.7 | 116.6 – 120 |
| 19300115 | 120.5-706R | 10.7 | 117.1 – 120.5 |

Available on request
(Diameter graduation 0.5 mm)

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|----------|-----------------------|-----------------|
| Band width 7 mm, thickness 0.6 mm (706R) | | | |
| On request | | 13 | 30.0 ... 120.5 |
| Band width 7 mm, thickness 0.8 mm (708R) | | | |
| On request | | 10.7 | 25.0 ... 120.5 |
| On request | | 13 | 30.0 ... 120.5 |
| Band width 10 mm, thickness 0.8 mm (1008R) | | | |
| On request | | 10.7 | 24.5 ... 120.5 |
| On request | | 13 | 30.0 ... 120.5 |
| Band width 10 mm, thickness 1.0 mm (1010R) | | | |
| On request | | 10.7 | 30.0 ... 120.5 |
| On request | | 13 | 30.0 ... 120.5 |

StepLess® Ear Clamps with Cup-Lock
193



Cup-Lock: Efficient lock solution for small clamp diameters

Material

193 Stainless steel, material no. 1.4301/UNS S30400

Corrosion resistance according to DIN EN ISO 9227

193 ≥ 1000 h

Standard Series

| Size range | width x thickness | ear width |
|----------------|-------------------|-----------|
| 19.0 – 31.0 mm | 10.0 x 0.8 mm | 8 mm |

Sizes

Diameter graduation 0.5 mm

Some sizes are only available if an appropriate minimum quantity is ordered. Customer specific sizes available on request.

Cup and staked interlock

The two locks hold the clamp geometry together securely. As the cup lock absorbs the closing force with its full material cross section, these clamps are able to achieve even higher radial forces.

Order information

For detailed order information, please contact your local Oetiker branch.

Assembly data

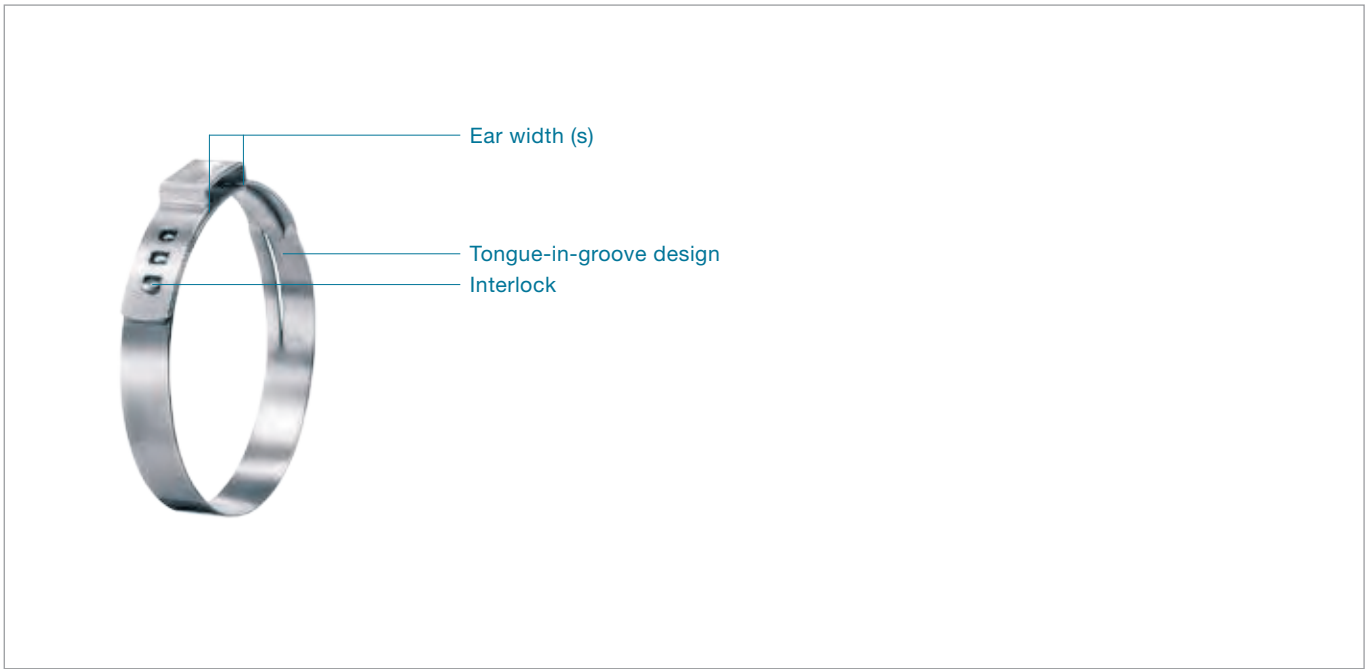
| Material dimensions (mm) | Size (mm) | Closing force max. (N) | Assembly tools force-monitored ¹ : | | | |
|--------------------------|-------------|------------------------|---|------------|----------|---------------------------|
| | | | Manual | Pneumatic | Cordless | Electronically controlled |
| 10 x 0.8 | 19.0 – 31.0 | 6600 | Clamping tool and Torque wrench | HO 7000 ME | CP 20 | HO 7000 EL |

For an alternative option, see our manual pincers on page 130

¹ Further information on page 108

Important note

These figures are intended as a guide, they may vary depending on the type and tolerances of parts being clamped. To ensure optimum clamp selection, we recommend making functional tests with several assemblies.



Narrow band: concentrates transmission of clamping force, less weight

360° StepLess®: uniform compression and uniform surface pressure

Clamp ear: compensates for component tolerances, adjustable surface pressure

Dimple: increases clamping force

Burr-free strip edges: reduced risk of damage to parts being clamped

StepLess® Ear Clamps 117 & 167

Material

117 Galvanized or zinc-plated steel band

167 Stainless Steel, Material no. 1.4301/UNS S30400

Optional alternative materials

Corrosion resistance according to DIN EN ISO 9227

117 Zinc-plated steel band ≥ 96 h

117 Galvanized steel band ≥ 144 h

167 ≥ 1000 h

Series 117

| Size range | width x thickness |
|----------------|-------------------|
| 11.9 – 17.7 mm | 7.0 x 0.6 mm |

Standard Series 167

| Size range | width x thickness |
|-----------------|-------------------|
| 6.5 – 11.8 mm | 5.0 x 0.5 mm |
| 11.9 – 120.5 mm | 7.0 x 0.6 mm |

Heavy Duty Series 167

| Size range | width x thickness |
|-----------------|-------------------|
| 24.5 – 120.5 mm | 10.0 x 0.8 mm |
| 62.0 – 120.5 mm | 10.0 x 1.0 mm |

Some sizes are only available if an appropriate minimum quantity is ordered. Customer specific sizes available on request.

Material thickness

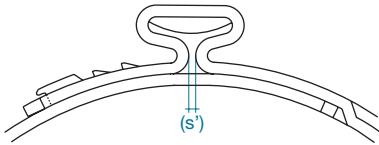
StepLess® Ear Clamps are produced in nominal widths and thicknesses. The selected material dimensions for a specific application are based on the stress required to obtain an adequate seal or load.

Clamp ear (closing element)

Using tools designed or endorsed by Oetiker, the clamp is closed by drawing together the lower radii of the “ear”. The maximum diameter reduction is proportionate to the open “ear” width (s).

The theoretical maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{Ear width (s)}}{\pi}$$



Note: the above sketch shows the appearance of a closed “ear” (s); it does not necessarily indicate an effective closed assembly.

The following applies as a guideline: To determine the correct clamp diameter, push the hose onto the attaching material, (e.g. the nipple), and then measure the outer diameter of the hose. Select a clamp whose average value of the diameter range is slightly greater than the hose’s outer diameter. A clamp can only be considered adequately closed when the ear width (s) has been reduced by at least 40%, and the correct closing force was used for assembly.

Block closure

Block closure is when the assembly force fully closes the ear, resulting in both ear legs touching (vertical members between the ear dimple and clamp radius). When this occurs the assembly force is absorbed by compressing the legs rather than transferring the assembly forces to the parts being clamped. If assembly forces are going to be measured, a block closure must be avoided.

Mechanical interlock

The interlock is a mechanical system for joining the clamp ends to permit closure. Some interlock designs can be opened for radial assembly prior to closure.

Assembly recommendations

The clamp’s ear should be closed at a uniform rate not exceeding the recommended maximum closing force. This will ensure clamp tension remains constant without overloading individual components of the assembly being joined, and of the clamps. Oetiker calls this assembly method “force priority”. Force priority ensures that tolerance compensating features of the clamp remain functional for every assembly. This ensures the resulting radial force remain approximately the same for every assembly, independent of any component’s dimensional fluctuation. If Oetiker’s ELK electronically controlled pneumatic pincers are used in force priority mode, assembly can be monitored to ensure repeatable installations are achieved at the proper force.

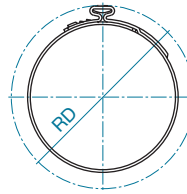
Closing force

As a matter of principle, the closing force selection is closely related to the desired compression or surface pressure of the material to be assembled. The resistance against the clamp corresponds to the applied force, so that the defined closing force is significantly reduced if soft materials are compressed.

The maximum closing forces are displayed in the table on the next page, depending on the material dimension. These specifically refer to thermoplastics or other less malleable materials with high Shore hardness.

Rotation diameter

The rotation diameter (RD) of an assembled clamp can be critical design information for applications that rotate in close proximity to adjacent components. Many factors can influence this final assembly diameter including compression, “ear” gap “s” and material thickness. It is recommended that all variables be considered and evaluated prior to specifying a rotating diameter.



Important

- The ear height is a natural result of ear deformation. Do not influence the ear height, either by changing the ear gap or with built-in hold-down devices in assembly tools.
- Single tool stroke closure only, do not apply secondary crimping force.

Assembly data

| Material dimensions (mm) | Size (mm) | Closing force max. (N) | Assembly tools force-monitored ¹ : | | | |
|--------------------------|--------------|------------------------|---|-------------------|----------|---------------------------|
| | | | Manual | Pneumatic | Cordless | Electronically controlled |
| 117 | | | | | | |
| 7 x 0.6 | 11.9 – 17.8 | 1100 | HMK 01/S01 | HO 2000 – 4000 ME | CP 10 | HO 2000 – 4000 EL |
| 167 | | | | | | |
| 5 x 0.5 | 6.5 – 11.8 | 1000 | HMK 01/S01 | HO 2000 – 4000 ME | CP 10 | HO 2000 – 4000 EL |
| 5 x 0.6 | 18.5 – 100.0 | 1700 | HMK 01/S01 | HO 2000 – 4000 ME | CP 10 | HO 2000 – 4000 EL |
| 7 x 0.6 | 11.9 – 17.5 | 2100 | HMK 01/S01 | HO 2000 – 4000 ME | CP 10 | HO 2000 – 4000 EL |
| | 17.8 – 120.5 | 2400 | HMK 01/S01 | HO 3000 – 4000 ME | CP 10 | HO 3000 – 4000 EL |
| 7 x 0.8 | 17.7 – 120.5 | 2800 | - | HO 3000 – 4000 ME | CP 10 | HO 3000 – 4000 EL |
| 9 x 0.6 | 21.0 – 120.5 | 2800 | - | HO 3000 – 4000 ME | CP 10 | HO 3000 – 4000 EL |
| 9 x 0.8 | 25.0 – 120.5 | 4100 | Clamping tool and Torque wrench | HO 4000 – 7000 ME | CP 10 | HO 4000 EL |
| 10 x 0.6 | 21.0 – 120.5 | 2900 | Clamping tool and Torque wrench | HO 4000 – 7000 ME | CP 10 | HO 4000 – 7000 EL |
| 10 x 0.8 | 24.5 – 120.5 | 5000 | Clamping tool and Torque wrench | HO 5000 – 7000 ME | CP 20 | HO 5000 – 7000 EL |
| 10 x 1.0 | 60.0 – 120.5 | 7000 ² | Clamping tool and Torque wrench | HO 7000 ME | CP 20 | HO 7000 – 10000 EL |
| 12 x 1.0 | 40.0 – 120.5 | 8500 ² | Clamping tool and Torque wrench | HO 7000 ME | CP 20 | HO 7000 – 10000 EL |

For an alternative option, see our manual pincers on page 130

¹ Further information on page 108

² For closing forces ≥ 7000 N, with the HO 7000, an inlet pressure of > 5.5 bar is required.

Important note

These figures are intended as a guide, they may vary depending on the type and tolerances of parts being clamped. To ensure optimum clamp selection, we recommend making functional tests with several assemblies.

Order information 117

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|---|-----------|--------------------------|-----------------|
| Galvanized steel band | | | |
| Band width 7 mm, thickness 0.6 mm (706) | | | |
| 11701202 | 011.9-706 | 8 | 9.4 – 11.9 |
| 11701081 | 012.3-706 | 8 | 9.8 – 12.3 |
| 11701100 | 012.8-706 | 8 | 10.3 – 12.8 |
| 11701061 | 013.3-706 | 8 | 10.8 – 13.3 |
| 11701101 | 013.8-706 | 8 | 11.3 – 13.8 |
| 11701102 | 014.0-706 | 8 | 11.5 – 14 |
| 11701108 | 014.5-706 | 8 | 12 – 14.5 |
| 11701062 | 014.8-706 | 8 | 12.3 – 14.8 |
| 11701109 | 015.3-706 | 8 | 12.8 – 15.3 |
| 11701063 | 015.7-706 | 8 | 13.2 – 15.7 |
| 11701103 | 016.2-706 | 8 | 13.7 – 16.2 |
| 11701119 | 016.6-706 | 8 | 14.1 – 16.6 |
| 11701110 | 016.8-706 | 8 | 14.3 – 16.8 |
| 11701064 | 017.0-706 | 8 | 14.5 – 17 |
| 11701065 | 017.5-706 | 8 | 15 – 17.5 |

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|---|-----------|--------------------------|-----------------|
| Zinc-plated steel band | | | |
| Band width 7 mm, thickness 0.6 mm (706) | | | |
| 11700583 | 011.9-706 | 8 | 9.4 – 11.9 |
| 11700584 | 012.3-706 | 8 | 9.8 – 12.3 |
| 11700585 | 012.8-706 | 8 | 10.3 – 12.8 |
| 11700586 | 013.3-706 | 8 | 10.8 – 13.3 |
| 11700587 | 013.8-706 | 8 | 11.3 – 13.8 |
| 11700588 | 014.0-706 | 8 | 11.5 – 14 |
| 11700568 | 014.5-706 | 8 | 12 – 14.5 |
| 11700589 | 014.8-706 | 8 | 12.3 – 14.8 |
| 11700569 | 015.3-706 | 8 | 12.8 – 15.3 |
| 11700570 | 015.7-706 | 8 | 13.2 – 15.7 |
| 11700571 | 016.2-706 | 8 | 13.7 – 16.2 |
| 11700572 | 016.6-706 | 8 | 14.1 – 16.6 |
| 11700590 | 016.8-706 | 8 | 14.3 – 16.8 |
| 11700591 | 017.0-706 | 8 | 14.5 – 17 |
| 11700573 | 017.5-706 | 8 | 15 – 17.5 |

Order information 167

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|------------|-----------------------|-----------------|
| Band width 5 mm, thickness 0.5 mm (505R) | | | |
| 16702488 | 006.5-505R | 4 | 5.3 – 6.5 |
| 16700001 | 007.0-505R | 4 | 5.8 – 7 |
| 16700002 | 008.0-505R | 4 | 6.8 – 8 |
| 16700003 | 008.7-505R | 5.5 | 7 – 8.7 |
| 16702491 | 009.0-505R | 5.5 | 7.3 – 9 |
| 16700004 | 009.5-505R | 5.5 | 7.8 – 9.5 |
| 16700005 | 010.0-505R | 5.5 | 8.3 – 10 |
| 16700006 | 010.5-505R | 5.5 | 8.8 – 10.5 |
| 16702492 | 010.9-505R | 5.5 | 9.2 – 10.9 |
| 16700007 | 011.3-505R | 5.5 | 9.6 – 11.3 |
| 16700008 | 011.8-505R | 5.5 | 10.1 – 11.8 |

Band width 7 mm, thickness 0.6 mm (706R)

| | | | |
|----------|------------|----|-------------|
| 16702951 | 011.9-706R | 8 | 9.4 – 11.9 |
| 16700009 | 012.3-706R | 8 | 9.8 – 12.3 |
| 16702493 | 012.8-706R | 8 | 10.3 – 12.8 |
| 16700010 | 013.3-706R | 8 | 10.8 – 13.3 |
| 16700011 | 013.8-706R | 8 | 11.3 – 13.8 |
| 16700012 | 014.0-706R | 8 | 11.5 – 14 |
| 16702864 | 014.2-706R | 8 | 11.7 – 14.2 |
| 16700013 | 014.5-706R | 8 | 12 – 14.5 |
| 16700014 | 014.8-706R | 8 | 12.3 – 14.8 |
| 16700015 | 015.3-706R | 8 | 12.8 – 15.3 |
| 16700016 | 015.7-706R | 8 | 13.2 – 15.7 |
| 16702998 | 016.0-706R | 8 | 13.5 – 16 |
| 16702494 | 016.2-706R | 8 | 13.7 – 16.2 |
| 16702495 | 016.6-706R | 8 | 14.1 – 16.6 |
| 16702496 | 016.8-706R | 8 | 14.3 – 16.8 |
| 16700017 | 017.0-706R | 8 | 14.5 – 17 |
| 16702497 | 017.5-706R | 8 | 15 – 17.5 |
| 16700018 | 017.8-706R | 10 | 14.6 – 17.8 |
| 16700019 | 018.0-706R | 10 | 14.8 – 18 |
| 16700020 | 018.5-706R | 10 | 15.3 – 18.5 |
| 16700110 | 019.2-706R | 10 | 16 – 19.2 |
| 16702498 | 019.8-706R | 10 | 16.6 – 19.8 |
| 16700024 | 021.0-706R | 10 | 17.8 – 21 |
| 16700026 | 022.6-706R | 10 | 19.4 – 22.6 |
| 16700028 | 023.5-706R | 10 | 20.3 – 23.5 |
| 16700029 | 024.1-706R | 10 | 20.9 – 24.1 |
| 16700031 | 025.6-706R | 10 | 22.4 – 25.6 |
| 16700033 | 027.1-706R | 10 | 23.9 – 27.1 |
| 16700035 | 028.6-706R | 10 | 25.4 – 28.6 |
| 16702047 | 030.1-706R | 10 | 26.9 – 30.1 |
| 16700039 | 030.8-706R | 10 | 27.6 – 30.8 |
| 16700040 | 031.6-706R | 10 | 28.4 – 31.6 |
| 16700042 | 033.1-706R | 10 | 29.9 – 33.1 |
| 16700044 | 034.6-706R | 10 | 31.4 – 34.6 |
| 16700046 | 036.1-706R | 10 | 32.9 – 36.1 |
| 16700048 | 037.6-706R | 10 | 34.4 – 37.6 |
| 16700050 | 038.1-706R | 10 | 34.9 – 38.1 |
| 16700052 | 039.6-706R | 10 | 36.4 – 39.6 |
| 16700053 | 041.0-706R | 10 | 37.8 – 41 |

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|------------|-----------------------|-----------------|
| Band width 7 mm, thickness 0.6 mm (706R) | | | |
| 16700054 | 042.5-706R | 10 | 39.3 – 42.5 |
| 16700055 | 044.0-706R | 10 | 40.8 – 44 |
| 16700056 | 045.5-706R | 10 | 42.3 – 45.5 |
| 16700057 | 047.0-706R | 10 | 43.8 – 47 |
| 16700058 | 048.5-706R | 10 | 45.3 – 48.5 |
| 16700059 | 050.0-706R | 10 | 46.8 – 50 |
| 16700060 | 051.5-706R | 10 | 48.3 – 51.5 |
| 16700061 | 053.0-706R | 10 | 49.8 – 53 |
| 16700062 | 054.5-706R | 10 | 51.3 – 54.5 |
| 16700063 | 056.0-706R | 10 | 52.8 – 56 |
| 16700064 | 057.5-706R | 10 | 54.3 – 57.5 |
| 16700065 | 059.0-706R | 10 | 55.8 – 59 |
| 16700066 | 060.5-706R | 10 | 57.3 – 60.5 |
| 16700067 | 062.0-706R | 10 | 58.8 – 62 |
| 16700068 | 063.5-706R | 10 | 60.3 – 63.5 |
| 16700069 | 065.0-706R | 10 | 61.8 – 65 |
| 16700070 | 066.5-706R | 10 | 63.3 – 66.5 |
| 16700071 | 068.0-706R | 10 | 64.8 – 68 |
| 16700072 | 069.5-706R | 10 | 66.3 – 69.5 |
| 16700073 | 071.0-706R | 10 | 67.8 – 71 |
| 16700074 | 072.5-706R | 10 | 69.3 – 72.5 |
| 16700075 | 074.0-706R | 10 | 70.8 – 74 |
| 16700076 | 075.5-706R | 10 | 72.3 – 75.5 |
| 16700077 | 077.0-706R | 10 | 73.8 – 77 |
| 16700078 | 078.5-706R | 10 | 75.3 – 78.5 |
| 16700079 | 080.0-706R | 10 | 76.8 – 80 |
| 16700080 | 081.5-706R | 10 | 78.3 – 81.5 |
| 16700081 | 083.0-706R | 10 | 79.8 – 83 |
| 16700082 | 084.5-706R | 10 | 81.3 – 84.5 |
| 16700083 | 086.0-706R | 10 | 82.8 – 86 |
| 16700084 | 087.5-706R | 10 | 84.3 – 87.5 |
| 16700085 | 089.0-706R | 10 | 85.8 – 89 |
| 16700086 | 090.5-706R | 10 | 87.3 – 90.5 |
| 16700087 | 092.0-706R | 10 | 88.8 – 92 |
| 16700088 | 093.5-706R | 10 | 90.3 – 93.5 |
| 16700089 | 095.0-706R | 10 | 91.8 – 95 |
| 16700090 | 096.5-706R | 10 | 93.3 – 96.5 |
| 16700091 | 098.0-706R | 10 | 94.8 – 98 |
| 16700092 | 099.5-706R | 10 | 96.3 – 99.5 |
| 16700093 | 101.0-706R | 10 | 97.8 – 101 |
| 16700094 | 102.5-706R | 10 | 99.3 – 102.5 |
| 16700095 | 104.0-706R | 10 | 100.8 – 104 |
| 16700096 | 105.5-706R | 10 | 102.3 – 105.5 |
| 16700097 | 107.0-706R | 10 | 103.8 – 107 |
| 16700098 | 108.5-706R | 10 | 105.3 – 108.5 |
| 16700099 | 110.0-706R | 10 | 106.8 – 110 |
| 16700100 | 111.5-706R | 10 | 108.3 – 111.5 |
| 16700101 | 113.0-706R | 10 | 109.8 – 113 |
| 16700102 | 114.5-706R | 10 | 111.3 – 114.5 |
| 16700103 | 116.0-706R | 10 | 112.8 – 116 |
| 16700104 | 117.5-706R | 10 | 114.3 – 117.5 |
| 16700105 | 119.0-706R | 10 | 115.8 – 119 |
| 16700106 | 120.5-706R | 10 | 117.3 – 120.5 |

Order information 167

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|------------|-----------------------|-----------------|
| Band width 9 mm, thickness 0.6 mm (906R) | | | |
| 16706383 | 021.0-906R | 10 | 17.8 – 21 |
| 16707693 | 022.6-906R | 10 | 19.4 – 22.6 |
| 16707694 | 023.5-906R | 10 | 20.3 – 23.5 |
| 16707695 | 024.1-906R | 10 | 20.9 – 24.1 |
| 16707696 | 025.6-906R | 10 | 22.4 – 25.6 |
| 16707533 | 027.1-906R | 10 | 23.9 – 27.1 |
| 16707697 | 028.6-906R | 10 | 25.4 – 28.6 |
| 16707698 | 030.1-906R | 10 | 26.9 – 30.1 |
| 16707517 | 030.8-906R | 10 | 27.6 – 30.8 |
| 16707488 | 031.6-906R | 10 | 28.4 – 31.6 |
| 16703913 | 033.1-906R | 10 | 29.9 – 33.1 |
| 16707641 | 034.6-906R | 10 | 31.4 – 34.6 |
| 16704715 | 036.1-906R | 10 | 32.9 – 36.1 |
| 16707494 | 037.6-906R | 10 | 34.4 – 37.6 |
| 16707645 | 038.1-906R | 10 | 34.9 – 38.1 |
| 16707306 | 039.6-906R | 10 | 36.4 – 39.6 |
| 16707300 | 041.0-906R | 10 | 37.8 – 41 |
| 16703914 | 042.5-906R | 10 | 39.3 – 42.5 |
| 16707301 | 044.0-906R | 10 | 40.8 – 44 |
| 16704719 | 045.5-906R | 10 | 42.3 – 45.5 |
| 16707536 | 047.0-906R | 10 | 43.8 – 47 |
| 16707479 | 048.5-906R | 10 | 45.3 – 48.5 |
| 16707304 | 050.0-906R | 10 | 46.8 – 50 |
| 16707480 | 051.5-906R | 10 | 48.3 – 51.5 |
| 16707537 | 053.0-906R | 10 | 49.8 – 53 |
| 16707477 | 054.5-906R | 10 | 51.3 – 54.5 |
| 16707700 | 056.0-906R | 10 | 52.8 – 56 |
| 16707701 | 057.5-906R | 10 | 54.3 – 57.5 |
| 16707540 | 059.0-906R | 10 | 55.8 – 59 |
| 16707372 | 060.5-906R | 10 | 57.3 – 60.5 |
| 16707702 | 062.0-906R | 10 | 58.8 – 62 |
| 16707703 | 063.5-906R | 10 | 60.3 – 63.5 |
| 16707518 | 065.0-906R | 10 | 61.8 – 65 |
| 16707542 | 066.5-906R | 10 | 63.3 – 66.5 |
| 16707357 | 068.0-906R | 10 | 64.8 – 68 |
| 16707688 | 069.5-906R | 10 | 66.3 – 69.5 |
| 16707041 | 071.0-906R | 10 | 67.8 – 71 |
| 16707704 | 072.5-906R | 10 | 69.3 – 72.5 |
| 16707705 | 074.0-906R | 10 | 70.8 – 74 |
| 16707404 | 075.5-906R | 10 | 72.3 – 75.5 |
| 16703915 | 077.0-906R | 10 | 73.8 – 77 |
| 16707366 | 078.5-906R | 10 | 75.3 – 78.5 |
| 16707405 | 080.0-906R | 10 | 76.8 – 80 |
| 16707543 | 081.5-906R | 10 | 78.3 – 81.5 |
| 16707545 | 083.0-906R | 10 | 79.8 – 83 |
| 16707706 | 084.5-906R | 10 | 81.3 – 84.5 |
| 16707707 | 086.0-906R | 10 | 82.8 – 86 |
| 16707708 | 087.5-906R | 10 | 84.3 – 87.5 |
| 16707384 | 089.0-906R | 10 | 85.8 – 89 |
| 16707710 | 090.5-906R | 10 | 87.3 – 90.5 |
| 16707547 | 092.0-906R | 10 | 88.8 – 92 |
| 16707325 | 093.5-906R | 10 | 90.3 – 93.5 |
| 16703916 | 095.0-906R | 10 | 91.8 – 95 |

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|------------|-----------------------|-----------------|
| Band width 9 mm, thickness 0.6 mm (906R) | | | |
| 16707548 | 096.5-906R | 10 | 93.3 – 96.5 |
| 16707242 | 098.0-906R | 10 | 94.8 – 98 |
| 16707711 | 099.5-906R | 10 | 96.3 – 99.5 |
| 16707713 | 101.0-906R | 10 | 97.8 – 101 |
| 16707714 | 102.5-906R | 10 | 99.3 – 102.5 |
| 16707385 | 104.0-906R | 10 | 100.8 – 104 |
| 16703918 | 105.5-906R | 10 | 102.3 – 105.5 |
| 16707715 | 107.0-906R | 10 | 103.8 – 107 |
| 16706709 | 108.5-906R | 10 | 105.3 – 108.5 |
| 16707716 | 110.0-906R | 10 | 106.8 – 110 |
| 16707717 | 111.5-906R | 10 | 108.3 – 111.5 |
| 16707718 | 113.0-906R | 10 | 109.8 – 113 |
| 16707719 | 114.5-906R | 10 | 111.3 – 114.5 |
| 16707178 | 116.0-906R | 10 | 112.8 – 116 |
| 16707179 | 117.5-906R | 10 | 114.3 – 117.5 |
| 16707720 | 119.0-906R | 10 | 115.8 – 119 |
| 16707276 | 120.5-906R | 10 | 117.3 – 120.5 |

Available on request
(Diameter graduation 0.5 mm)

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|---|----------|-----------------------|-----------------|
| Band width 10 mm, thickness 0.8 (1008R) | | | |
| On request | | 10 | 24.5 ... 120.5 |
| Band width 10 mm, thickness 1.0 (1010R) | | | |
| On request | | 10 | 62.0 ... 120.5 |



360° StepLess® design

Narrow band for concentrated compression

Fast, simple and secure assembly

Tamper-detectable design

Requires only one assembly tool

Conforms to ASTM F877/F2098

StepLess® Ear Clamps PEX Series 167

PEX connecting solutions for markets compliant with Standard ASTM1 F877/F2098

Material

167 Stainless Steel, Material no. 1.4301/UNS S30400

Corrosion resistance according to DIN EN ISO 9227

167 ≥ 1000 h

Standard PEX Series 167

| Diameter range | PEX tube | width x thickness |
|----------------|----------|-------------------|
| 13.3 mm | 3/8 inch | 7 x 0.6 mm |
| 17.5 mm | 1/2 inch | 7 x 0.8 mm |
| 20.8 mm | 5/8 inch | 7 x 0.8 mm |
| 23.3 mm | 3/4 inch | 9 x 0.8 mm |
| 29.6 mm | 1/1 inch | 10 x 1.0 mm |

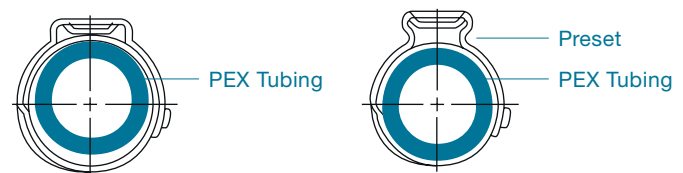
PEXGrip® Series 167

| Diameter range | PEX tube | width x thickness |
|----------------|----------|-------------------|
| 17.5 mm | 1/2 inch | 7 x 0.8 mm |
| 23.3 mm | 3/4 inch | 9 x 0.8 mm |

Field of application

Oetiker StepLess® Ear Clamps 167 for PEX plumbing connections are suitable for ASTM F876 Polyethylene cross-linked PEX tubing with ASTM F1807/F2159 insert fittings. The clamp sizes are solely intended for PEX applications with corresponding inch sizes. The robust interlock design, specifically developed for PEX applications, provides high radial loads of the clamp.

The PEXGrip® Series 167 is preset to prevent the clamp from sliding. It grips the tube for easy assembly.



International Standards

Oetiker Standard PEX Series 167 and PEXGrip® Series 167 comply with ASTM¹ F2098 stainless steel clamps for use with ASTM F1807 or F2159 insert fittings for PEX² tubing and are certified by NSF³ to carry the cNSFus-PW mark:

¹ ASTM = American Society for Testing and Materials

² PEX = Polyethylene cross-linked

³ NSF = National Sanitation Foundation

For additional information, please refer to ASTM International Standards Worldwide and the NSF Organization.

Assembly instructions

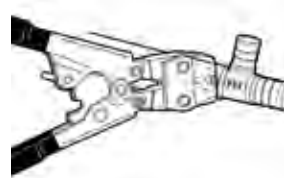
Clamps must be completely closed for the correct assembly of the Oetiker PEX clamp with PEX tubing. Oetiker’s ratchet pincers for assembly of PEX clamps are F2098 compliant and will only release when the clamp is fully closed. For proper assembly, use the Oetiker recommended tool.

Warning:

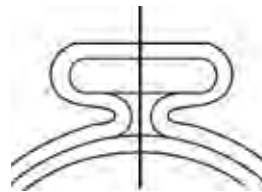
- In high chloride water conditions, use only plastic fittings
- Do not install in contact with concrete
- Use only ASTM F1807 or F2159 insert fittings with Oetiker F2098 clamps



The recommended distance (dimension) between the “Clamp” and “End of the Tube” is 1/8”–1/4”.



Slip clamp over tubing and then close clamp ear with tool, tool will not release until clamp is fully closed.



Visually inspect clamp for correct closed ear form.

Assembly data

| PEX tube (inch ⁴) | Material dimensions (mm) | Clamp size (mm) | Closing force max. (N) | Assembly tools not force-monitored, manual ⁵ | Assembly tools force-monitored ⁵ : | |
|-------------------------------|--------------------------|-----------------|------------------------|---|---|----------|
| | | | | | Pneumatic | Cordless |
| 3/8 | 7 x 0.6 | 13.3 | 2200 | 2-Handle Ratchet Pincer and 3-Handle Ratchet Pincer | HO 3000 ME | CP 10 |
| 1/2 | 7 x 0.8 | 17.5 | 3900 | 2-Handle Ratchet Pincer and 3-Handle Ratchet Pincer | HO 5000 ME | CP 20 |
| 5/8 | 7 x 0.8 | 20.8 | 3900 | 2-Handle Ratchet Pincer and 3-Handle Ratchet Pincer | HO 5000 ME | CP 20 |
| 3/4 | 9 x 0.8 | 23.3 | 5000 | 2-Handle Ratchet Pincer and 3-Handle Ratchet Pincer | HO 5000 ME | CP 20 |
| 1 | 10 x 1.0 | 29.6 | 7000 | 2-Handle Ratchet Pincer and 3-Handle Ratchet Pincer | HO 5000 – 7000 ME | CP 20 |

⁴ 1 inch = 25.4 mm

⁵ Further information on page 130

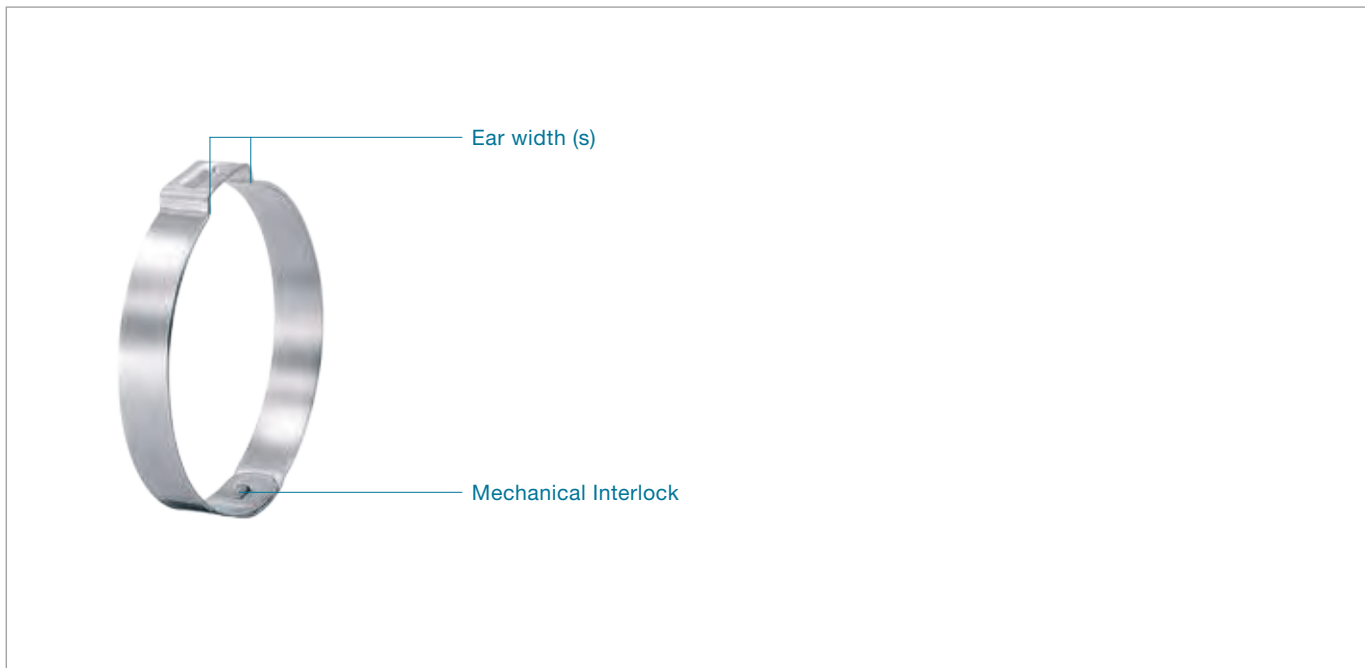
Important note

The specifications of ASTM Standard F2098 must be met. When using force-monitored closing tools, the clamp must be verified as being correctly (completely) closed.

Order information

| Diameter Range | PEX tube | Band width x thickness | Standard PEX clamp item no. | PEXGrip® clamp item no. |
|----------------|----------|------------------------|-----------------------------|-------------------------|
| 13.3 mm | 3/8 inch | 7 x 0.6 mm | 16703334 | - |
| 17.5 mm | 1/2 inch | 7 x 0.8 mm | 16703335 | 16707872 |
| 20.8 mm | 5/8 inch | 7 x 0.8 mm | 16705571 | - |
| 23.3 mm | 3/4 inch | 9 x 0.8 mm | 16703336 | 16707955 |
| 29.6 mm | 1 inch | 10 x 1.0 mm | 16704150 | - |





Clamp ear: fast and simple assembly, visible deformation provides evidence of proper closure

Dimple: increases clamping force

Burr-free strip edges: reduced risk of damage to parts being clamped

1-Ear Clamps with mechanical interlock 105 & 155

Material

105 Galvanized or zinc-plated steel band

155 Stainless Steel, Material no. 1.4301/UNS S30400

Corrosion resistance according to DIN EN ISO 9227

105 Zinc-plated steel band ≥ 96 h

105 Galvanized steel band ≥ 144 h

155 ≥ 1000 h

Series

| Size range | width x thickness |
|-----------------|-------------------|
| 10.5 – 116.0 mm | 7.0 x 0.6/0.8 mm |

Some sizes are only available if an appropriate minimum quantity is ordered.

105 only available on request.

Using tools designed or endorsed by Oetiker, the clamp is closed by drawing together the lower radii of the “ear”. The maximum diameter reduction is proportional to the open “ear” width. The theoretical maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{Ear width (s)}}{\pi}$$

To ensure perfect sealing, clamp ears must be correctly closed during assembly.

Clamp diameter

The following applies as a guideline: To determine the correct clamp diameter, push the hose onto the attaching material, (e.g. the nipple), and then measure the outer diameter of the hose. Select a clamp whose average value of the diameter range is slightly greater than the hose’s outer diameter.

Mechanical interlock

The mechanical interlock is a mechanical connection which keeps the clamp securely closed. By using a mechanical interlock instead of spot-welding, corrosion around the closure elements is reduced.

Assembly recommendations

The clamp ear should be closed with a constant tool jaw force, this practice is referred to as “force priority closure”. This assembly method ensures that a uniform and repeatable stress is applied to the application with a constant tensile force on the mechanical interlock.

Employing this methodology when closing 105 & 155 series clamps will compensate for any component tolerance variations, and ensure that the clamp applies a constant radial force to the application. Fluctuations in component tolerances are absorbed by variations in the “ear” gap (the space between the lower radii after assembly).

Closing force

It is important to realize that there is in a very close relationship between the desired compression of the material being clamped and the closing force selected. The table below gives maximum closing forces in relation to the size of the part being clamped.

Important

Single tool stroke closure only, do not apply secondary crimping force.

Assembly data

| Size (mm) | Closing force max. (N) | Assembly tools force-monitored ¹ : | | |
|--------------|------------------------|---|------------|----------|
| | | Manual | Pneumatic | Cordless |
| 10.5 – 17.0 | 1200 | HMK 01/S01 | HO 2000 ME | CP 10 |
| 18.5 – 116.0 | 2000 | HMK 01/S01 | HO 2000 ME | CP 10 |

For an alternative option, see our manual pincers on page 130

¹ Further information on page 108

Important note

These figures are intended as a guide, they may vary depending on the type and tolerances of parts being clamped. To ensure optimum clamp selection, we recommend making functional tests with several assemblies.

Order information

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|---|----------|-----------------------|-----------------|
| 1-Ear Clamp with mechanical interlock, stainless Band width 7.0 mm, thickness 0.6 mm | | | |
| 15500000 | 0105.0R | 5 | 8.9 – 10.5 |
| 15500001 | 0113.0R | 5 | 9.7 – 11.3 |
| 15500002 | 0123.0R | 6 | 10.4 – 12.3 |
| 15500003 | 0133.0R | 6 | 11.4 – 13.3 |
| 15500004 | 0135.0R | 6.5 | 11.5 – 13.5 |
| 15500005 | 0138.0R | 6 | 11.9 – 13.8 |
| 15500006 | 0140.0R | 6.5 | 11.9 – 14 |
| 15500007 | 0145.0R | 6 | 12.6 – 14.5 |
| 15500008 | 0157.0R | 7 | 13.5 – 15.7 |
| 15500009 | 0170.0R | 6 | 15.1 – 17 |
| 15500010 | 0185.0R | 9 | 15.7 – 18.5 |
| 15500011 | 0198.0R | 9 | 17 – 19.8 |
| 15500012 | 0210.0R | 9 | 18.2 – 21 |
| 15500013 | 0226.0R | 9 | 19.8 – 22.6 |
| 15500014 | 0241.0R | 9 | 21.3 – 24.1 |
| 15500015 | 0256.0R | 9 | 22.8 – 25.6 |
| 15500016 | 0271.0R | 10 | 24 – 27.1 |
| 15500017 | 0286.0R | 10 | 25.5 – 28.6 |
| 15500018 | 0301.0R | 10 | 27 – 30.1 |
| 15500019 | 0316.0R | 10 | 28.5 – 31.6 |
| 15500020 | 0331.0R | 10 | 30 – 33.1 |
| 15500021 | 0346.0R | 10 | 31.5 – 34.6 |
| 15500022 | 0361.0R | 10 | 33 – 36.1 |
| 15500023 | 0376.0R | 10 | 34.5 – 37.6 |
| 15500024 | 0381.0R | 10 | 35 – 38.1 |
| 15500025 | 0396.0R | 10 | 36.5 – 39.6 |

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|---|----------|-----------------------|-----------------|
| 1-Ear Clamp with mechanical interlock, stainless Band width 7.0 mm, thickness 0.6 mm | | | |
| 15500026 | 0410.0R | 10 | 37.9 – 41 |
| 15500027 | 0425.0R | 10 | 39.4 – 42.5 |
| 15500028 | 0440.0R | 10 | 40.9 – 44 |
| 15500029 | 0455.0R | 10 | 42.4 – 45.5 |
| 15500030 | 0470.0R | 10 | 43.9 – 47 |
| 15500031 | 0485.0R | 10 | 45.4 – 48.5 |
| 15500032 | 0500.0R | 10 | 46.9 – 50 |
| 15500033 | 0515.0R | 10 | 48.4 – 51.5 |
| 15500034 | 0530.0R | 10 | 49.9 – 53 |
| 15500035 | 0545.0R | 10 | 51.4 – 54.5 |
| 15500036 | 0560.0R | 10 | 52.9 – 56 |
| 15500037 | 0575.0R | 10 | 54.4 – 57.5 |
| 15500038 | 0590.0R | 10 | 55.9 – 59 |
| 15500039 | 0605.0R | 10 | 57.4 – 60.5 |
| 15500040 | 0620.0R | 10 | 58.9 – 62 |
| 15500041 | 0635.0R | 10 | 60.4 – 63.5 |
| 15500042 | 0650.0R | 10 | 61.9 – 65 |
| 15500043 | 0665.0R | 10 | 63.4 – 66.5 |
| 15500044 | 0680.0R | 10 | 64.9 – 68 |
| 15500045 | 0695.0R | 10 | 66.4 – 69.5 |
| 15500046 | 0710.0R | 10 | 67.9 – 71 |
| 15500047 | 0725.0R | 10 | 69.4 – 72.5 |
| 15500048 | 0740.0R | 10 | 70.9 – 74 |
| 15500049 | 0755.0R | 10 | 72.4 – 75.5 |
| 15500050 | 0770.0R | 10 | 73.9 – 77 |
| 15500051 | 0785.0R | 10 | 75.4 – 78.5 |

Order information

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|--|----------|--------------------------|-----------------|
| 1-Ear Clamp with mechanical interlock, stainless | | | |
| Band width 7.0 mm, thickness 0.6 mm | | | |
| 15500052 | 0800.0R | 10 | 76.9 – 80 |
| 15500053 | 0815.0R | 10 | 78.4 – 81.5 |
| 15500054 | 0830.0R | 10 | 79.9 – 83 |
| 15500055 | 0845.0R | 10 | 81.4 – 84.5 |
| 15500056 | 0860.0R | 10 | 82.9 – 86 |
| 15500057 | 0875.0R | 10 | 84.4 – 87.5 |
| 15500058 | 0890.0R | 10 | 85.9 – 89 |
| 15500059 | 0905.0R | 10 | 87.4 – 90.5 |
| 15500060 | 0920.0R | 10 | 88.9 – 92 |
| 15500061 | 0935.0R | 10 | 90.4 – 93.5 |
| 15500062 | 0950.0R | 10 | 91.9 – 95 |
| 15500063 | 0965.0R | 10 | 93.4 – 96.5 |
| 15500064 | 0980.0R | 10 | 94.9 – 98 |
| 15500065 | 0995.0R | 10 | 96.4 – 99.5 |
| 15500066 | 1010.0R | 10 | 97.9 – 101 |
| 15500067 | 1025.0R | 10 | 99.4 – 102.5 |
| 15500101 | 1040.0R | 10 | 100.9 – 104 |
| 15500068 | 1055.0R | 10 | 102.4 – 105.5 |
| 15500102 | 1070.0R | 10 | 103.9 – 107 |
| 15500103 | 1085.0R | 10 | 105.4 – 108.5 |
| 15500104 | 1100.0R | 10 | 106.9 – 110 |
| 15500105 | 1115.0R | 10 | 108.4 – 111.5 |
| 15500106 | 1130.0R | 10 | 109.9 – 113 |
| 15500107 | 1145.0R | 10 | 111.4 – 114.5 |
| 15500069 | 1160.0R | 10 | 112.9 – 116 |



Choice of engagement positions: clamp can be adjusted to several nominal diameters
 Clamp ear: simple and fast assembly, visible deformation provides evidence of proper closure
 Burr-free strip edges: reduced risk of damage to parts being clamped
 Connecting technology: ideal for soft materials

Adjustable Clamps 109, 159

Material

109 Zinc-plated steel band

159 Stainless Steel, Material no. 1.4301/UNS S30400

Corrosion resistance according to DIN EN ISO 9227

109 \geq 96 h

159 \geq 1000 h

Adjustable Clamp 109

| Size range | width x thickness |
|-----------------|-------------------|
| 29.5 – 122.0 mm | 7.0 x 0.8 mm |
| 29.5 – 122.0 mm | 9.0 x 0.8 mm |

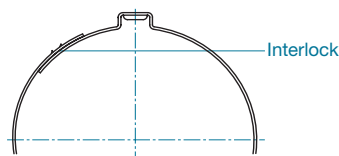
Adjustable Clamp 159

| Size range | width x thickness |
|-----------------|-------------------|
| 25.0 – 50.0 mm | 7.0 x 0.8 mm* |
| 40.0 – 110.0 mm | 7.0 x 0.8 mm* |

* Diameter range covered by a single clamp

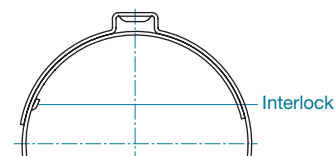
Some sizes are only available if an appropriate minimum quantity is ordered.

159 – Adjustable clamp:



Version with interlock outside may make assembly easier

109/159 – Adjustable clamps:



Version with interlock inside

Clamp ear (closing element)

Using tools designed by Oetiker, the clamp is closed by drawing together the lower radii of the “ear”. The maximum diameter reduction is proportional to the open “ear” width (s).

The theoretical maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{Ear width (s)}}{\pi}$$

Multi-position interlock

The interlock consists of one or two load-retaining hooks that withstand tensile loading during closure and a lock tab designed to hold the hooks in their windows prior to closure. With both designs the interlock can be engaged in several positions within the published range. This feature allows a single part to cover a range of diameters.

Assembly Recommendations**109 & 159 – Adjustable Clamps**

109 Adjustable Clamps are supplied pre-shaped and engaged at mid-diameter. 159 clamps are supplied flat. The clamp must be shaped prior to assembly. Each incremental step of the interlock reduces the diameter before closure by approximately 1.6 mm. The following assembly steps demonstrate how best to achieve an effective geometry.

The clamp ear of both variants should be closed with constant tool jaw force, this practice is referred to as “force priority closure”. This assembly method ensures that a uniform and repeatable stress is applied to the application with a constant tensile force on the mechanical interlock.

Closing force

The closing force must be chosen to give the required material compression or surface pressure and should be qualified by dimensional evaluation and experiment. The resistance against the clamp equals the applied force, so the closing force is greatly reduced when compressing a soft material. The table below gives the maximum applied closing force for clamp and material dimensions.

Important

Single tool stroke closure only, do not apply secondary crimping force.

Assembly data

| Material dimensions (mm) | Size (mm) | Closing force max. (N) | Assembly tools force-monitored ¹ : | | |
|--------------------------|--------------|------------------------|---|------------|----------|
| | | | Manual | Pneumatic | Cordless |
| 109 | | | | | |
| 7 x 0.8 | 29.5 – 122.0 | 1400 | HMK 01/S01 | HO 2000 ME | CP 10 |
| 9 x 0.8 | 29.5 – 122.0 | 1800 | HMK 01/S01 | HO 2000 ME | CP 10 |
| 159 | | | | | |
| 7 x 0.8 | 25.0 – 50.0 | 2400 | HMK 01/S01 | HO 3000 ME | CP 10 |
| 7 x 0.8 | 40.0 – 110.0 | 2400 | HMK 01/S01 | HO 3000 ME | CP 10 |

For an alternative option, see our manual pincers on page 130

¹ Further information on page 108

Important note

These figures are intended as a guide, they may vary depending on the type and tolerances of parts being clamped. To ensure optimum clamp selection, we recommend making functional tests with several assemblies.

Assembly instructions

159 – Version with interlock outside



Step 1
Pre-shape clamp.



Step 2
Determine the clamp length.



Step 3
Cut off the remaining material.
To avoid possible injury deburr cut edges with a file.



Step 4
Place the clamp over object.
Engage interlocking hooks in tightest window position.
Firmly crimp the ear with Oetiker pincers.

159 – Version with interlock inside



Step 1
Pre-shape clamp.



Step 2
Determine the clamp length.
Make sure the end of the clamp passes the "ear", as shown.



Step 3
Cut off the remaining material.
To avoid possible injury deburr cut edges with a file.



Step 4
Place the clamp over object.
Engage interlocking hooks in tightest window position.
Firmly crimp the ear with Oetiker pincers.

Order information

| Item No. | Ref. size* | Diameter range (mm) | Diameter range (inch) |
|----------|------------|---------------------|-----------------------|
|----------|------------|---------------------|-----------------------|

109

Band width 7 mm, thickness 0.8 mm, Ear width 10 mm

| | | | |
|----------|-------|--------------|--|
| 10900012 | 29.5 | 24.5 – 29.5 | |
| 10900016 | 34.2 | 29.5 – 36.0 | |
| 10900018 | 42.3 | 36.0 – 45.5 | |
| 10900020 | 55.1 | 45.5 – 61.5 | |
| 10900022 | 74.3 | 61.5 – 85.5 | |
| 10900014 | 106.1 | 85.5 – 122.0 | |

Band width 9 mm, thickness 0.8 mm, Ear width 10 mm

| | | | |
|----------|-------|--------------|--|
| 10900013 | 29.5 | 24.5 – 29.5 | |
| 10900017 | 34.2 | 29.5 – 36.0 | |
| 10900019 | 42.3 | 36.0 – 45.5 | |
| 10900021 | 55.1 | 45.5 – 61.5 | |
| 10900023 | 74.3 | 61.5 – 85.5 | |
| 10900015 | 106.1 | 85.5 – 122.0 | |

* Ref. size = Condition as supplied:
Formed and engaged at the mid-diameter.

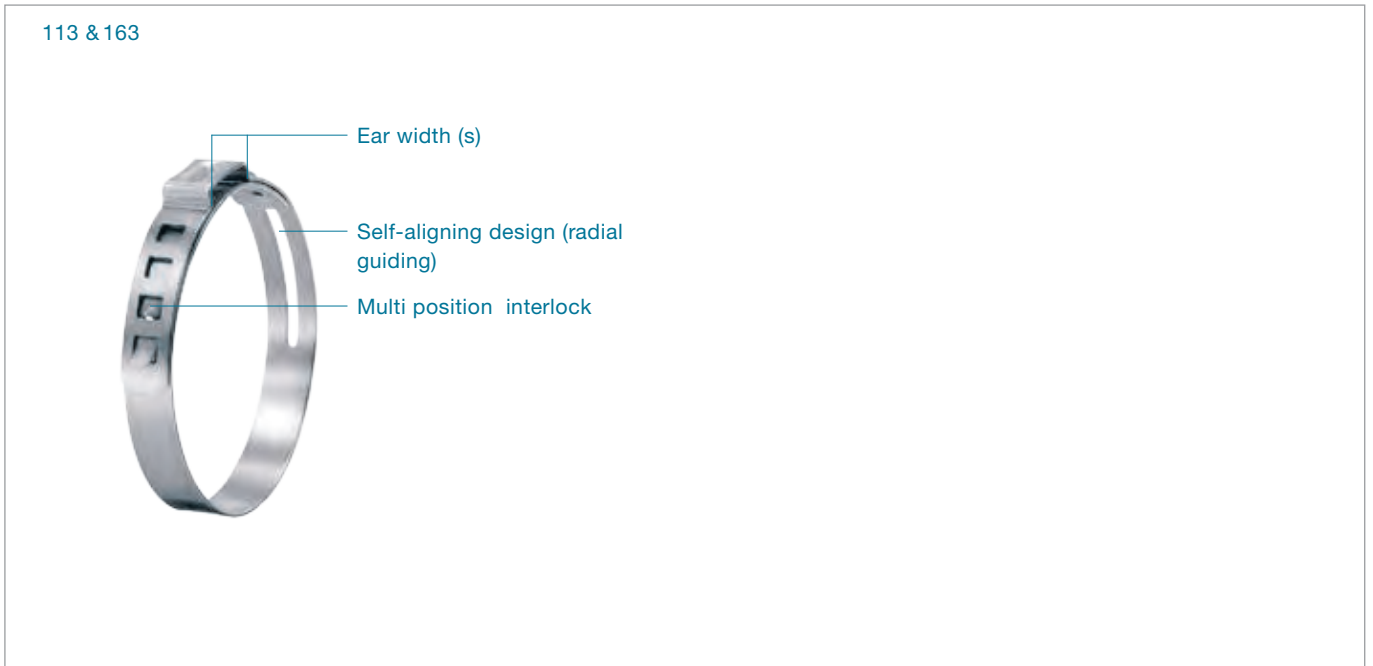
| Item No. | Ref. size* | Diameter range (mm) | Diameter range (inch) |
|----------|------------|---------------------|-----------------------|
|----------|------------|---------------------|-----------------------|

159

Band width 7 mm, thickness 0.8 mm, Ear width 8.5 mm

| | | | |
|--------------------------------|--|--------------|--|
| Version with interlock outside | | | |
| 15900002 | | 25.0 – 50.0 | |
| 15900004 | | 40.0 – 110.0 | |
| Version with interlock inside | | | |
| 15900005 | | 25.0 – 50.0 | |
| 15900007 | | 40.0 – 110.0 | |

* Ref. size = Condition as supplied:
Formed and engaged at the mid-diameter.



Choice of engagement positions: clamp can be adjusted to several nominal diameters

Inner ring with radial guidance: effective and powerful all-round sealing

Clamp ear: simple and fast assembly, visible deformation provides evidence of proper closure

Burr-free strip edges: reduced risk of damage to parts being clamped

Connecting technology: ideal for soft materials

Adjustable Clamps 113 & 163

Material

113 Zinc-plated high-strength Steel, Material no. 1.0934

163 Stainless Steel, Material no. 1.4301/UNS S30400

Corrosion resistance according to DIN EN ISO 9227

113 ≥ 96 h

163 ≥ 1000 h

Series

| Size range | width x thickness |
|-----------------|-------------------|
| 30.0 – 116.0 mm | 7.0 x 0.6 mm |
| 72.0 – 132.0 mm | 9.0 x 0.6 mm |

Some sizes are only available if an appropriate minimum quantity is ordered.

Clamp ear (closing element)

Using tools designed by Oetiker, the clamp is closed by drawing together the lower radii of the “ear”. The maximum diameter reduction is proportional to the open “ear” width (s). The theoretical maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{Ear width (s)}}{\pi}$$

Multi-position interlock

The interlock consists of one or two load-retaining hooks that withstand tensile loading during closure and a lock tab designed to hold the hooks in their windows prior to closure. With both designs the interlock can be engaged in several positions within the published range. This feature allows a single part to cover a range of diameters.

Radial guiding (self-aligning design)

A tab formed on the inner portion of the clamp locates in a slot in the outer band surface. During assembly and closure, the tab slides in the slot and so avoids any step around the inner circumference of the clamp.

Assembly Recommendations

163 – Adjustable Clamps with radial guiding

The clamp can be assembled axially on the application prior to assembly or alternatively, radially around the assembled components. For either method, it is important that the hooks and lock tab are engaged in windows giving the smallest possible diameter, so that the maximum clearance between the assembled components and the inside diameter of the clamp before closure is no greater than 1.5 mm. Each incremental step of the interlock reduces the diameter before closure by 1.6 mm on the “3-step” series, and by 1.05 mm on the “6- step” design.

Closing force

The closing force must be chosen to give the required material compression or surface pressure and should be qualified by dimensional evaluation and experiment. The resistance against the clamp equals the applied force, so the closing force is greatly reduced when compressing a soft material. The table below gives the maximum applied closing force for clamp and material dimensions.

Important

Single tool stroke closure only, do not apply secondary crimping force.

Assembly data

| Material dimensions (mm) | Size (mm) | Closing force max. (N) | Assembly tools force-monitored ¹ : | | | |
|--------------------------|--------------|------------------------|---|-------------------|----------|---------------------------|
| | | | Manual | Pneumatic | Cordless | Electronically controlled |
| 113 | | | | | | |
| 7 x 0.6 | 30.0 – 116.0 | 1400 | HMK 01/S01 | HO 2000 ME | CP 10 | HO 2000 EL |
| 9 x 0.6 | 72.0 – 132.0 | 2200 | HMK 01/S01 | HO 2000 ME | CP 10 | HO 2000 EL |
| 163 | | | | | | |
| 7 x 0.6 | 30.0 – 50.0 | 1800 | HMK 01/S01 | HO 2000 – 3000 ME | CP 10 | HO 2000 – 3000 EL |
| 7 x 0.6 | 56.0 – 116.0 | 2400 | HMK 01/S01 | HO 3000 ME | CP 10 | HO 3000 EL |
| 9 x 0.6 | 72.0 – 132.0 | 2800 | - | HO 3000 ME | CP 10 | HO 3000 EL |

For an alternative option, see our manual pincers on page 130

¹ Further information on page 108

Important note

These figures are intended as a guide, they may vary depending on the type and tolerances of parts being clamped. To ensure optimum clamp selection, we recommend making functional tests with several assemblies.

Order information

| Item No. | Ref. size* | Diameter range (mm) | Diameter range (inch) |
|--|------------|---------------------|-----------------------|
| 113 | | | |
| 3 adjustment positions Band width 7 mm, thickness 0.6 mm, Ear width 10 mm | | | |
| 11300020 | 30 | 23.6 – 30.0 | 0.929 – 1.181 |
| 11300000 | 32 | 25.6 – 32.0 | 1.008 – 1.260 |
| 11300001 | 35 | 28.6 – 35.0 | 1.126 – 1.378 |
| 11300002 | 37 | 30.6 – 37.0 | 1.205 – 1.457 |
| 11300003 | 40 | 33.6 – 40.0 | 1.323 – 1.575 |
| 11300004 | 45 | 38.6 – 45.0 | 1.520 – 1.772 |
| 11300021 | 50 | 43.6 – 50.0 | 1.717 – 1.969 |

6 adjustment positions
Band width 7 mm, thickness 0.6 mm, Ear width 10 mm

| | | | |
|----------|-----|---------------|---------------|
| 11300028 | 56 | 47.5 – 56.0 | 1.870 – 2.205 |
| 11300017 | 62 | 53.5 – 62.0 | 2.106 – 2.441 |
| 11300029 | 68 | 59.5 – 68.0 | 2.343 – 2.677 |
| 11300018 | 74 | 65.5 – 74.0 | 2.579 – 2.913 |
| 11300005 | 80 | 71.5 – 80.0 | 2.815 – 3.150 |
| 11300006 | 86 | 77.5 – 86.0 | 3.051 – 3.386 |
| 11300007 | 92 | 83.5 – 92.0 | 3.287 – 3.622 |
| 11300008 | 94 | 85.5 – 94.0 | 3.366 – 3.701 |
| 11300009 | 98 | 89.5 – 98.0 | 3.524 – 3.858 |
| 11300010 | 104 | 95.5 – 104.0 | 3.760 – 4.094 |
| 11300030 | 107 | 98.5 – 107.0 | 3.878 – 4.213 |
| 11300011 | 110 | 101.5 – 110.0 | 3.996 – 4.331 |
| 11300019 | 116 | 107.5 – 116.0 | 4.232 – 4.567 |

4 adjustment positions
Band width 9 mm, thickness 0.6 mm, Ear width 10 mm

| | | | |
|----------|-----|---------------|---------------|
| 11300022 | 72 | 64.0 – 72.0 | 2.520 – 2.835 |
| 11300023 | 78 | 70.0 – 78.0 | 2.756 – 3.071 |
| 11300024 | 84 | 76.0 – 84.0 | 2.992 – 3.307 |
| 11300012 | 90 | 82.0 – 90.0 | 3.228 – 3.543 |
| 11300013 | 96 | 88.0 – 96.0 | 3.465 – 3.780 |
| 11300014 | 102 | 94.0 – 102.0 | 3.701 – 4.016 |
| 11300015 | 108 | 100.0 – 108.0 | 3.937 – 4.252 |
| 11300016 | 114 | 106.0 – 114.0 | 4.173 – 4.488 |
| 11300025 | 120 | 112.0 – 120.0 | 4.409 – 4.724 |
| 11300026 | 126 | 118.0 – 126.0 | 4.645 – 4.961 |
| 11300027 | 132 | 124.0 – 132.0 | 4.882 – 5.197 |

* Ref. size = Condition as supplied:
Formed and engaged at the mid-diameter.

| Item No. | Ref. size* | Diameter range (mm) | Diameter range (inch) |
|--|------------|---------------------|-----------------------|
| 163 | | | |
| 3 adjustment positions Band width 7 mm, thickness 0.6 mm, Ear width 10 mm | | | |
| 16300022 | 30 | 23.6 – 30.0 | 0.929 – 1.181 |
| 16300179 | 32 | 25.6 – 32.0 | 1.008 – 1.260 |
| 16300023 | 35 | 28.6 – 35.0 | 1.126 – 1.378 |
| 16300251 | 37 | 30.6 – 37.0 | 1.205 – 1.457 |
| 16300024 | 40 | 33.6 – 40.0 | 1.323 – 1.575 |
| 16300025 | 45 | 38.6 – 45.0 | 1.520 – 1.772 |
| 16300026 | 50 | 43.6 – 50.0 | 1.717 – 1.969 |

6 adjustment positions
Band width 7 mm, thickness 0.6 mm, Ear width 10 mm

| | | | |
|----------|-----|---------------|---------------|
| 16300027 | 56 | 47.5 – 56.0 | 1.870 – 2.205 |
| 16300028 | 62 | 53.5 – 62.0 | 2.106 – 2.441 |
| 16300029 | 68 | 59.5 – 68.0 | 2.343 – 2.677 |
| 16300030 | 74 | 65.5 – 74.0 | 2.579 – 2.913 |
| 16300031 | 80 | 71.5 – 80.0 | 2.815 – 3.150 |
| 16300032 | 86 | 77.5 – 86.0 | 3.051 – 3.386 |
| 16300033 | 92 | 83.5 – 92.0 | 3.287 – 3.622 |
| 16300051 | 94 | 85.5 – 94.0 | 3.366 – 3.701 |
| 16300034 | 98 | 89.5 – 98.0 | 3.524 – 3.858 |
| 16300035 | 104 | 95.5 – 104.0 | 3.760 – 4.094 |
| 16300250 | 107 | 98.5 – 107.0 | 3.878 – 4.213 |
| 16300036 | 110 | 101.5 – 110.0 | 3.996 – 4.331 |
| 16300037 | 116 | 107.5 – 116.0 | 4.232 – 4.567 |

4 adjustment positions
Band width 9 mm, thickness 0.6 mm, Ear width 10 mm

| | | | |
|----------|-----|---------------|---------------|
| 16300038 | 72 | 64.0 – 72.0 | 2.520 – 2.835 |
| 16300039 | 78 | 70.0 – 78.0 | 2.756 – 3.071 |
| 16300040 | 84 | 76.0 – 84.0 | 2.992 – 3.307 |
| 16300041 | 90 | 82.0 – 90.0 | 3.228 – 3.543 |
| 16300042 | 96 | 88.0 – 96.0 | 3.465 – 3.780 |
| 16300043 | 102 | 94.0 – 102.0 | 3.701 – 4.016 |
| 16300044 | 108 | 100.0 – 108.0 | 3.937 – 4.252 |
| 16300046 | 114 | 106.0 – 114.0 | 4.173 – 4.488 |
| 16300045 | 120 | 112.0 – 120.0 | 4.409 – 4.724 |
| 16300053 | 126 | 118.0 – 126.0 | 4.645 – 4.961 |
| 16300129 | 132 | 124.0 – 132.0 | 4.882 – 5.197 |

* Ref. size = Condition as supplied:
Formed and engaged at the mid-diameter.



Compact one-piece clamp: for robust, secure connections, miniature sizes

Clamp ear: fast and simple assembly, visible deformation provides evidence of proper closure

Deburred edges: reduced risk of damage to parts being clamped

154 with pre-shaped insert: effective and powerful all-round seal

1-Ear Clamps 153 & 154

Material

153 Stainless Steel, Material no. 1.4307/UNS S30403

154 Clamp: Stainless Steel, Material no. 1.4307/ UNS S30403

Insert: Stainless Steel, Material no. 1.4310/UNS S30100

Corrosion resistance according to DIN EN ISO 9227

153 ≥ 800 h

154 ≥ 800 h

Size range

153 3.3 – 30.7 mm

154 2.9 – 30.0 mm

Some sizes are only available if an appropriate minimum quantity is ordered.

Process

The manufacturing process for Oetiker 1-Ear and 2-Ear Clamps commences with the spiral roll-forming and welding of raw material into lengths of tube, a technique developed to obtain a robust, continuous welded ring.

Oetiker 1-Ear Clamps with insert

This type of clamp combines the geometry and properties of the 1-Ear Clamp with an insert made of stainless steel.

These clamps are ideal for demanding applications involving soft or hard rubbers and plastics. The thin-walled insert ring (up to 0.3 mm thick), with an oval protrusion that locates in the ear space, bridges the ear gap and ensures almost uniform compression around the whole circumference of a clamp.

Edge condition

Burrs generated during the shearing and forming processes are entirely eliminated in a barrel-finishing operation.

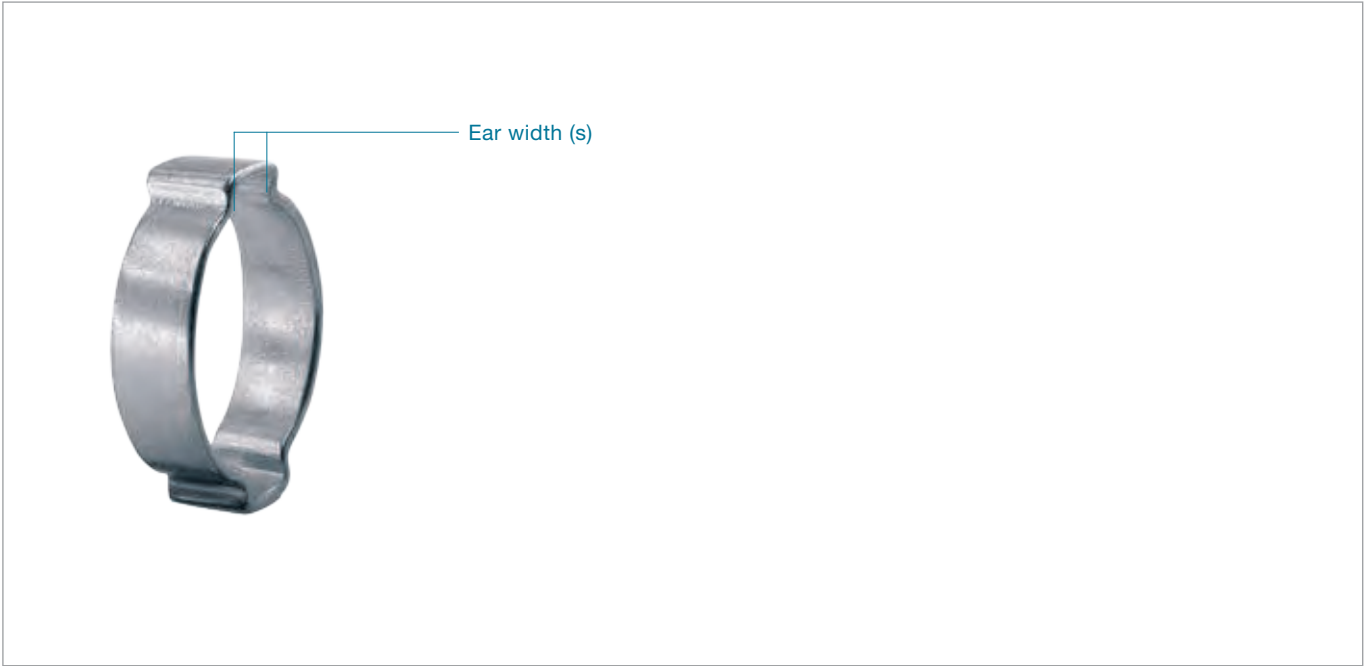
Clamp ear (closing element)

Using tools designed or endorsed by Oetiker, the clamp is closed by drawing together the lower radii of the “ear”. The maximum diameter reduction is proportional to the open “ear” width. The maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{Ear width (s)}}{\pi}$$

Important

Single tool stroke closure only, do not apply secondary crimping force.



- 2-Ear version: [extended clamping range](#)
- Compact one-piece clamp: [for robust, secure connections](#)
- Clamp ear: [fast and simple assembly, visible deformation provides evidence of proper closure](#)
- Deburred edges: [reduced risk of damage to parts being clamped](#)

2-Ear Clamps 101 & 151

| |
|--|
| Material |
| 101 Zinc-plated steel, Material no. 1.0338/SAE 1008/1010 |
| 151 Stainless Steel, Material no. 1.4307/UNS S30403 |

| |
|--|
| Corrosion resistance according to DIN EN ISO 9227 |
| 101 ≥ 96 h |
| 151 ≥ 800 h |

| |
|-------------------|
| Size range |
| 4.1 – 46.0 mm |

Some sizes are only available if an appropriate minimum quantity is ordered.

Oetiker 2-Ear Clamps
 The ears of these clamps do not have a dimple and nearly double the clamping range, compared to the 1-Ear Clamp. 2 ears provide a degree of elasticity to accommodate changes in size of the parts being joined, such as that which may be caused by thermal expansion or vibration.

Assembly techniques are similar to those for 1-Ear Clamps, but the force applied when closing the second ear may react against

the opposing closed ear and make a second crimping operation necessary. For perfect sealing, the ears must be adequately closed during assembly.

Assembly recommendations
 The ears of these clamps should be closed with the recommended, uniform force (known as force priority). This method will result in a constant, reproducible stress within the clamp material, without overloading either the clamp or the parts being assembled. The nominal diameter of the clamp should always be chosen so that, when assembled with the correct clamping force, the ears are almost closed. Complete process monitoring and 100% process documentation are available using the “Electronically Controlled Pneumatic Power Tool” Oetiker ELK.

Closing force
 The following table shows the maximum applied closing force for different material dimensions.

Important
 Single tool stroke closure only, do not apply secondary crimping force.

Assembly data

| Size (mm) | Closing force max. (N) | | Assembly tools force-monitored ¹ : | | | |
|----------------------|------------------------|-----------|---|------------|----------|---------------------------|
| | galvanized | stainless | Manual | Pneumatic | Cordless | Electronically controlled |
| 153 | | | | | | |
| 3.3 – 11.0 | - | 1400 | HMK 01/S01 | HO 2000 ME | CP 10 | HO 2000 EL |
| 11.3 – 20.7 | - | 2300 | HMK 01/S01 | HO 3000 ME | CP 10 | HO 3000 EL |
| 21.0 – 30.7 | - | 2800 | - | HO 3000 ME | CP 10 | HO 3000 EL |
| 154 | | | | | | |
| 3.3 – 11.8 | - | 1500 | HMK 01/S01 | HO 2000 ME | CP 10 | HO 2000 EL |
| 12.0 – 20.7 | - | 2500 | HMK 01 | HO 3000 ME | CP 10 | HO 3000 EL |
| 21.0 – 30.7 | - | 3600 | Clamping tool and Torque wrench | HO 4000 ME | CP 10 | HO 4000 EL |
| 101 & 151 | | | | | | |
| 4.1 – 20.0 | 2200 | 2500 | HMK 01/S01 | HO 3000 ME | CP 10 | HO 3000 EL |
| 22.0 – 46.0 | 3400 | 3600 | Clamping tool and Torque wrench | HO 3000 ME | CP 10 | HO 4000 EL |

For an alternative option, see our manual pincers on page 130

¹ Further information on page 108

Important note

These figures are intended as a guide, they may vary depending on the type and tolerances of parts being clamped. To ensure optimum clamp selection, we recommend making functional tests with several assemblies.

Order information

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|----------|----------|-----------------------|-----------------|
|----------|----------|-----------------------|-----------------|

1-Ear Clamp, stainless

| | | | |
|----------|-------|-----|-------------|
| 15300000 | 03.3R | 1.4 | 2.9 – 3.3 |
| 15300001 | 03.5R | 1.4 | 3 – 3.5 |
| 15300002 | 04.1R | 2.5 | 3.3 – 4.1 |
| 15300054 | 04.6R | 3 | 3.8 – 4.6 |
| 15300003 | 05.1R | 3.2 | 4.1 – 5.1 |
| 15300055 | 05.6R | 3.2 | 4.6 – 5.6 |
| 15300004 | 06.1R | 3.2 | 5.1 – 6.1 |
| 15300005 | 06.6R | 3.2 | 5.6 – 6.6 |
| 15300006 | 07.0R | 3 | 6.1 – 7 |
| 15300007 | 07.5R | 3.5 | 6.5 – 7.5 |
| 15300008 | 08.0R | 4 | 6.8 – 8 |
| 15300009 | 08.3R | 4 | 7.1 – 8.3 |
| 15300010 | 08.7R | 4 | 7.5 – 8.7 |
| 15300011 | 09.0R | 5 | 7.5 – 9 |
| 15300012 | 09.5R | 5 | 8.1 – 9.5 |
| 15300013 | 10.0R | 5 | 8.5 – 10 |
| 15300014 | 10.5R | 5 | 9.1 – 10.5 |
| 15300015 | 11.0R | 5.5 | 9.3 – 11 |
| 15300016 | 11.3R | 5.5 | 9.6 – 11.3 |
| 15300017 | 11.8R | 5.5 | 10.1 – 11.8 |
| 15300018 | 12.0R | 6.5 | 10.1 – 12 |
| 15300019 | 12.3R | 6.5 | 10.3 – 12.3 |
| 15300020 | 12.8R | 6.5 | 10.8 – 12.8 |

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|----------|----------|-----------------------|-----------------|
|----------|----------|-----------------------|-----------------|

1-Ear Clamp, stainless

| | | | |
|----------|-------|-----|-------------|
| 15300021 | 13.3R | 6.5 | 11.3 – 13.3 |
| 15300022 | 13.8R | 6.5 | 11.8 – 13.8 |
| 15300023 | 14.0R | 6.5 | 12 – 14 |
| 15300024 | 14.5R | 6.5 | 12.5 – 14.5 |
| 15300025 | 15.0R | 6.5 | 13 – 15 |
| 15300026 | 15.5R | 6.5 | 13.5 – 15.5 |
| 15300027 | 16.0R | 7 | 13.8 – 16 |
| 15300028 | 16.5R | 8 | 14 – 16.5 |
| 15300029 | 16.8R | 7 | 14.6 – 16.8 |
| 15300030 | 17.5R | 7 | 15.3 – 17.5 |
| 15300031 | 18.5R | 7 | 16.3 – 18.5 |
| 15300032 | 19.5R | 7.5 | 17.2 – 19.5 |
| 15300033 | 20.0R | 7.5 | 17.7 – 20 |
| 15300034 | 20.7R | 9 | 17.9 – 20.7 |
| 15300035 | 21.0R | 7.5 | 18.7 – 21 |
| 15300036 | 21.8R | 7.5 | 19.5 – 21.8 |
| 15300037 | 22.5R | 8.5 | 19.9 – 22.5 |
| 15300038 | 23.5R | 8.5 | 21 – 23.5 |
| 15300040 | 24.5R | 9 | 21.7 – 24.5 |
| 15300041 | 25.5R | 9 | 22.7 – 25.5 |
| 15300043 | 26.3R | 8.5 | 23.6 – 26.3 |
| 15300044 | 27.0R | 9.5 | 24.1 – 27 |
| 15300045 | 30.7R | 11 | 27.2 – 30.7 |

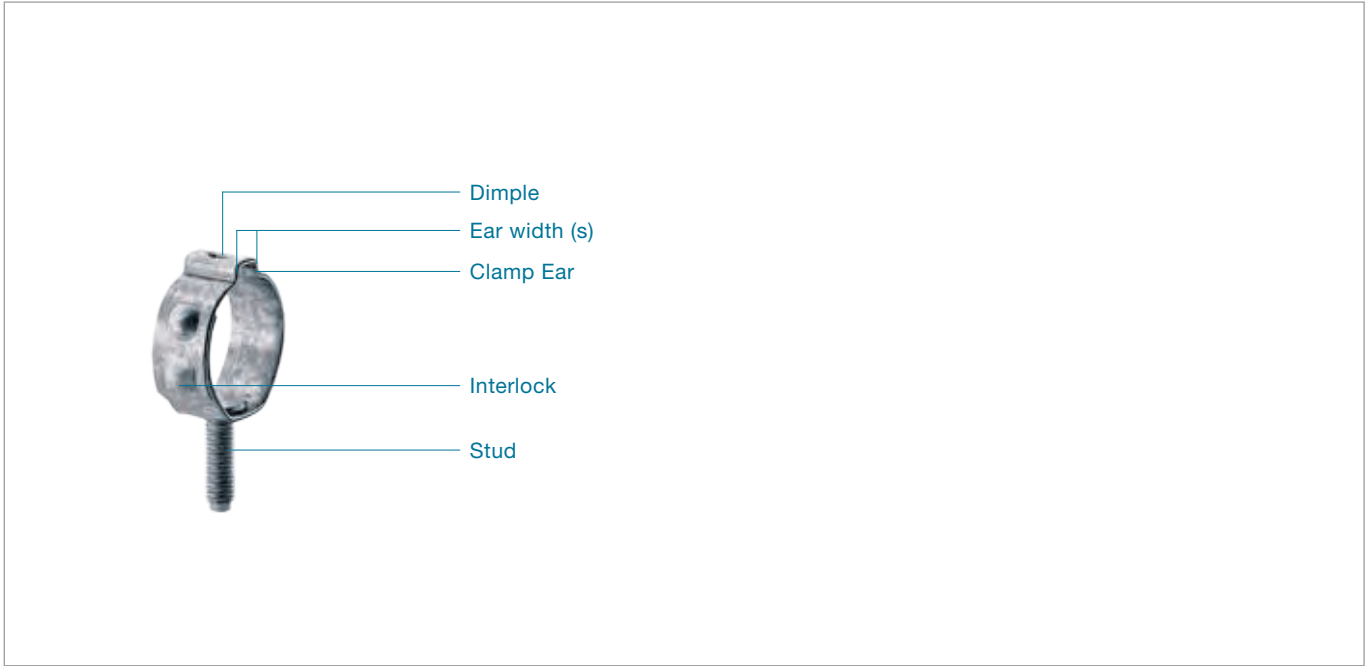
Order information

| Item No. | Ref. No. | Ear width inside (mm) | Size range (mm) |
|------------------------------------|----------|--------------------------|-----------------|
| 1-Ear Clamp with insert, stainless | | | |
| 15400010 | 03.3RER | 1.4 | 2.5 – 2.9 |
| 15400011 | 03.5RER | 1.4 | 2.7 – 3.1 |
| 15400012 | 04.1RER | 2.5 | 2.9 – 3.7 |
| 15400063 | 04.6RER | 3 | 3.4 – 4.2 |
| 15400013 | 05.1RER | 3.2 | 3.7 – 4.7 |
| 15400064 | 05.6RER | 3.2 | 4.2 – 5.2 |
| 15400014 | 06.1RER | 3.2 | 4.7 – 5.7 |
| 15400015 | 06.6RER | 3.2 | 5.2 – 6.2 |
| 15400016 | 07.0RER | 3 | 5.6 – 6.5 |
| 15400017 | 07.5RER | 3.5 | 5.9 – 7 |
| 15400018 | 08.0RER | 4 | 6.3 – 7.5 |
| 15400019 | 08.3RER | 4 | 6.6 – 7.8 |
| 15400020 | 08.7RER | 4 | 7 – 8.2 |
| 15400021 | 09.0RER | 5 | 7 – 8.5 |
| 15400022 | 09.5RER | 5 | 7.5 – 9 |
| 15400023 | 10.0RER | 5 | 8 – 9.5 |
| 15400024 | 10.5RER | 5 | 8.5 – 10 |
| 15400025 | 11.0RER | 5.5 | 8.8 – 10.5 |
| 15400026 | 11.3RER | 5.5 | 9.1 – 10.8 |
| 15400027 | 11.8RER | 5.5 | 9.6 – 11.3 |
| 15400028 | 12.0RER | 6.5 | 9.5 – 11.5 |
| 15400029 | 12.3RER | 6.5 | 9.8 – 11.8 |
| 15400030 | 12.8RER | 6.5 | 10.3 – 12.3 |
| 15400031 | 13.3RER | 6.5 | 10.6 – 12.6 |
| 15400032 | 13.8RER | 6.5 | 11.1 – 13.1 |
| 15400033 | 14.0RER | 6.5 | 11.3 – 13.3 |
| 15400034 | 14.5RER | 6.5 | 11.8 – 13.8 |
| 15400035 | 15.0RER | 6.5 | 12.3 – 14.3 |
| 15400036 | 15.5RER | 6.5 | 12.8 – 14.8 |
| 15400037 | 16.0RER | 7 | 13.1 – 15.3 |
| 15400038 | 16.5RER | 8 | 13.2 – 15.8 |
| 15400039 | 16.8RER | 7 | 13.9 – 16.1 |
| 15400040 | 17.5RER | 7 | 14.6 – 16.8 |
| 15400041 | 18.5RER | 7 | 15.6 – 17.8 |
| 15400042 | 19.5RER | 7.5 | 16.5 – 18.8 |
| 15400043 | 20.0RER | 7.5 | 17.1 – 19.3 |
| 15400044 | 20.7RER | 9 | 17.1 – 20 |
| 15400045 | 21.0RER | 7.5 | 18 – 20.3 |
| 15400046 | 21.8RER | 7.5 | 18.8 – 21.1 |
| 15400065 | 22.5RER | 8.5 | 19.2 – 21.8 |
| 15400048 | 23.5RER | 8.5 | 20.2 – 22.8 |
| 15400049 | 24.5RER | 9 | 21 – 23.8 |
| 15400050 | 25.5RER | 9 | 22 – 24.8 |
| 15400051 | 26.3RER | 8.5 | 23 – 25.6 |
| 15400052 | 27.0RER | 9.5 | 23.3 – 26.3 |
| 15400053 | 30.7RER | 11 | 26.5 – 30 |

| Item No. | Ref. No. | Size range (mm) |
|--------------------------|----------|-----------------|
| 2-Ear Clamp, zinc-plated | | |
| 10100000 | 0041 | 3.1 – 4.1 |
| 10100001 | 0045 | 3.5 – 4.5 |
| 10100002 | 0305 | 3.4 – 5 |
| 10100004 | 0507 | 5 – 7 |
| 10100008 | 0709 | 7 – 9 |
| 10100011 | 0811 | 8 – 11 |
| 10100016 | 1113 | 11 – 13 |
| 10100019 | 1315 | 12.5 – 15 |
| 10100022 | 1517 | 14 – 17 |
| 10100024 | 1518 | 15 – 18 |
| 10100097 | 1619 | 16 – 19 |
| 10100027 | 1720 | 16 – 20 |
| 10100029 | 1922 | 18 – 22 |
| 10100030 | 2023 | 19 – 23 |
| 10100032 | 2225 | 21 – 25 |
| 10100034 | 2327 | 22.5 – 27 |
| 10100035 | 2528 | 24 – 28 |
| 10100037 | 2731 | 26.3 – 31 |
| 10100041 | 3134 | 29.3 – 34 |
| 10100043 | 3437 | 32 – 37 |
| 10100045 | 3740 | 35 – 40 |
| 10100047 | 4043 | 37.6 – 43 |
| 10100049 | 4346 | 40.6 – 46 |

2-Ear Clamp, stainless

| | | |
|----------|-------|-----------|
| 15100000 | 0041R | 3.1 – 4.1 |
| 15100001 | 0045R | 3.5 – 4.5 |
| 15100002 | 0305R | 3.4 – 5 |
| 15100003 | 0507R | 5 – 7 |
| 15100004 | 0709R | 7 – 9 |
| 15100023 | 0811R | 8 – 11 |
| 15100006 | 1113R | 11 – 13 |
| 15100007 | 1315R | 12.5 – 15 |
| 15100008 | 1517R | 14 – 17 |
| 15100009 | 1518R | 15 – 18 |
| 15100010 | 1720R | 16.2 – 20 |
| 15100011 | 1922R | 18.1 – 22 |
| 15100012 | 2023R | 19.1 – 23 |
| 15100013 | 2225R | 21.1 – 25 |
| 15100014 | 2327R | 22.5 – 27 |
| 15100015 | 2528R | 24 – 28 |
| 15100016 | 2731R | 26.3 – 31 |
| 15100018 | 3134R | 29.3 – 34 |
| 15100019 | 3437R | 32 – 37 |
| 15100020 | 3740R | 35 – 40 |
| 15100021 | 4043R | 37.6 – 43 |
| 15100022 | 4346R | 40.6 – 46 |



Secure: reliable fixation of airbag inflators within occupant safety systems

Cost effective: allows a versatile alternative to attaching inflators, eliminating the need for custom brackets

Space saving: ear position of 180 or 45 degree offers easy assembly

Flexible: easily adjustable clamp positioning

Made to measure: various diameters available with M5 or M6 studs for standard size inflators

Strong: high strength low alloy material with high retention properties + good corrosion resistance

Reliable assembly: quick and easy assembly with process monitoring equipment

1-Ear Clamp with stud 103

For Occupant Safety Systems

Material

103 Galvanized steel band

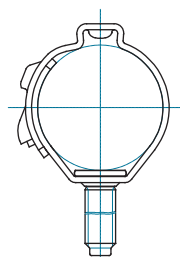
Corrosion resistance according to DIN EN ISO 9227

103 \geq 72 h

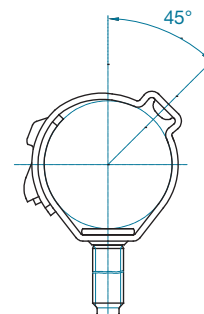
| Size range | width x thickness | stud size |
|----------------|-------------------|-----------|
| 20.6 – 50.0 mm | 10.0 x 1.0 mm | M5 and M6 |
| 20.6 – 50.0 mm | 14.0 x 1.0 mm | M5 and M6 |

Ear Positioning Options*

1-Ear Clamp with stud,
180° ear



1-Ear Clamp with stud,
45° ear



* For detailed ordering information please contact your local Oetiker branch

Material

The band of Oetiker 1-Ear Clamps with Stud are made from Gal-fan material. The studs are made from zinc-plated material.

Band edge condition

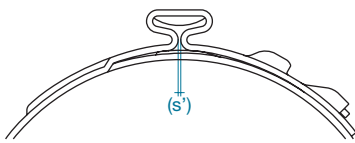
Stringent controls are maintained at the Oetiker strip process, conditioning the slit material and forming a machined or rolled edge radius. This process reduces the potential for damage caused by sharp or square edges, when the clamp compresses adjacent material.

Clamp ear (closing element)

Using tools designed or endorsed by Oetiker, the clamp is closed by drawing together the lower radii of the “ear”. The maximum diameter reduction is proportionate to the open “ear” width (s).

The theoretical maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{Ear width (s)}}{\pi}$$



Note: the above sketch shows the appearance of a closed “ear” (s’); it does not necessarily indicate an effective closed assembly.

Mechanical interlock

The interlock is a mechanically jointed design for securing the clamp in the round condition.

Ear design

The integrated dimple in the ear effectively increases the clamping force and provides a spring effect when the diameter of the application contracts or expands due to thermal or mechanical influences.

Stud torque

The stud torque has to be adjusted individually.

Assembly recommendations

The clamp “ear” is deformed with a constant tool jaw force; this practice is referred to as “force priority closure”. The assembly method assures that a uniform and repeatable stress is applied to the application in addition to a consistent tensile force on the clamp interlock. Employing this methodology when closing the 103 series clamp will compensate for any component tolerance variations, assuring that the clamp applies a constant radial force on the application. Fluctuations in component tolerances are absorbed by the changing “ear” gap (s’). Clamp assembly monitoring equipment and process data collection is available by incorporating the “Electronically Controlled Pneumatic Power Tool” Oetiker ELK within the assembly process.

Order information

For detailed order information, please contact your local Oetiker branch.

Important

Single tool stroke closure only, do not apply secondary crimping force.

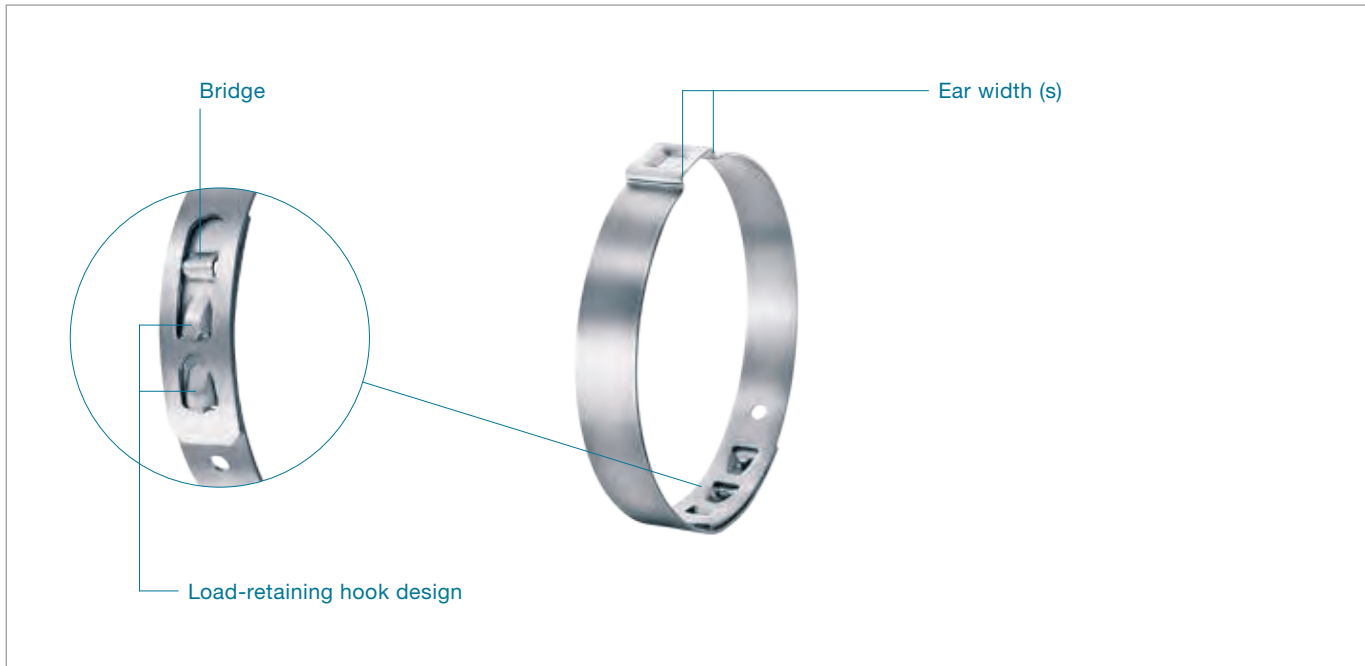
Assembly data

| Material dimensions (mm) | Size (mm) | Stud | Closing force max. (N) | | Recommended pneumatic pincer ¹ | Recommended pincer heads | |
|--------------------------|-------------|------|------------------------|--------------------------|---|--------------------------|----------|
| | | | DX51D ² | HX380LAD ^{2, 3} | | EL | ME |
| 10 x 1.0 | 20.6 – 50.0 | M6 | 3450 | 4600 | HO 5000 EL/ME | 13900772 | 13900773 |
| 10 x 1.0 | 20.6 – 50.0 | M5 | 3850 | 5000 | HO 5000 EL/ME | 13900772 | 13900773 |
| 14 x 1.0 | 20.6 – 50.0 | M6 | 6000 | 7000 | HO 7000 EL/ME | 13900772 | 13900773 |
| 14 x 1.0 | 20.6 – 50.0 | M5 | 6400 | 7400 | HO 7000 EL/ME | 13900772 | 13900773 |

¹ Further information on page 110

² Base steel material

³ HX > 21.2 mm



Radial assembly: open the clamp for axial and radial assembly with freedom of movement

Quick closure: simple, secure mounting, thanks to the form-fitting closure design

Bridge: to correctly mount the clamp

Scale resistant stainless steel: excellent strength and corrosion resistance at high temperatures

Flexible: available closed or prerounded.

1-Ear Clamp SV 153

Material

153 SV 18 SR™, high oxidation resistance

Corrosion resistance according to DIN EN ISO 9227

153 SV ≥ 400 h

| Size range | width x thickness | ear width |
|-----------------|-------------------|-----------|
| 40.0 – 150.0 mm | 12.0 x 0.8 mm | 13 mm |

Sizes

Diameter graduation 0.5 mm

Some sizes are only available if an appropriate minimum quantity is ordered.

Material

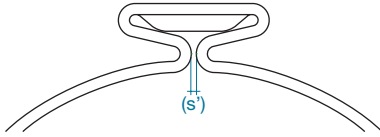
Oetiker 1-Ear Clamps SV are manufactured from stainless steel (18 SR™), offering excellent heat resistance. The selected material is a good combination of toughness and durability, which represent the basic prerequisites for the assembly process of clamps.

Clamp ear (closing element)

Using tools designed or endorsed by Oetiker, the clamp is closed by drawing together the lower radii of the “ear”. The maximum diameter reduction is proportionate to the open “ear” width (s).

The theoretical maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{Ear width (s)}}{\pi}$$



The representation makes no claim to full closure of the clamp ear(s), but only serves as a sketched visualization of a closed clamp.

The following applies as a guideline: To determine the correct clamp diameter, push the hose onto the attaching material, (e.g. the nipple) and then measure the outer diameter of the hose. The value of the outer diameter must be slightly above the average value of the diameter range of the clamp to be selected.

The clamp is only then sufficiently closed when the original ear width (s) is reduced by at least 50% and it has been ensured that the correctly defined closing force was used during assembly. Further details regarding the closing force, the functioning of the tolerance compensation, and constantly guaranteed roundness are described in the Section “Assembly Recommendations”.

Bridge

In line with the error avoidance principle, the bridge prevents the clamp from being incorrectly mounted.

Load-retaining hook design

The closure is a mechanical connecting element and serves to hold the clamp geometry together securely. The closure is designed so that the clamp can be opened before the device is closed for the purpose of radial assembly.

Assembly Recommendations

The “clamp ear” should be closed with a recommended and uniform closing force – force priority. This ensures that the tension loading of the strip material remains permissible and consistently traceable, without overloading individual components, parts to be ligated, and clamps. The force priority assembly allows the tolerance compensation to remain functional during every closure and each radial force to remain approximately the same, based on the resulting size(s) of the ear gap, which changes depending on the component tolerances. Clamp installation monitoring and process data collection are available by incorporating the “Electronically Controlled Pneumatic Power Tool” Oetiker ELK in the assembly process.

Closing force

As a matter of principle, the closing force selection is closely related to the desired retaining characteristics of the material to be assembled. In specific applications, it sometimes leads to a generous undercutting of the defined closing forces.

Function

The 1-Ear Clamp SV is only suitable for applications with the required sealing function

Order information

For detailed order information, please contact your local Oetiker branch.

Important

Single tool stroke closure only, do not apply secondary crimping force.

Assembly data

| Material dimensions (mm) | Size (mm) | Closing force max. (N) | Assembly tools force-monitored ¹ : | | | |
|--------------------------|--------------|------------------------|---|------------|----------|---------------------------|
| | | | Manual | Pneumatic | Cordless | Electronically controlled |
| 12 x 0.8 | 40.0 – 150.0 | 5000 | Clamping tool and Torque wrench | HO 5000 ME | CP 20 | HO 5000 EL |

¹ Further information on page 108

Important note

These figures are intended as a guide, they may vary depending on the type and tolerances of parts being clamped. To ensure optimum clamp selection, we recommend making functional tests with several assemblies.

Low Profile Clamps

p. 60

ToothLock® Low Profile Clamp
292

p. 64 / 68

StepLess® Low Profile Clamps with/
without tolerance compensation
168



ToothLock® technology:

- + Very high and permanent compression
- + Superior radial load performance
- + Highly pressure and expansion resistant

CrossTech®:

- + Ultra low profile design
- + Very low imbalance on rotating parts

StepLess®:

- + Uniform compression
- + Powerful all-round seal
- + Withstands thermal stress, shock- and vibration-resistant

Reusability:

- + Can be repeatedly opened and re-assembled

Low assembled height:

- + Minimum space requirement
- + Minimal imbalance on rotating parts

360° StepLess®:

- + Uniform 360° compression and uniform surface pressure

Tolerance compensation:

- + Provides a degree of compensation for component tolerances

Oetiker will be pleased to help you to find the correct choice for your application. Send sample parts and all relevant information for your specific application to Oetiker, and you will receive recommendations for product type, diameter, and method of assembly.

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StepLess® Low Profile Clamp
192

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Clamp ER
194



Tolerance compensation elements:

- + Allow for variations in component tolerances and temperature variations

360° StepLess®:

- + Uniform 360° compression and uniform surface pressure

Novel tensioning hook design:

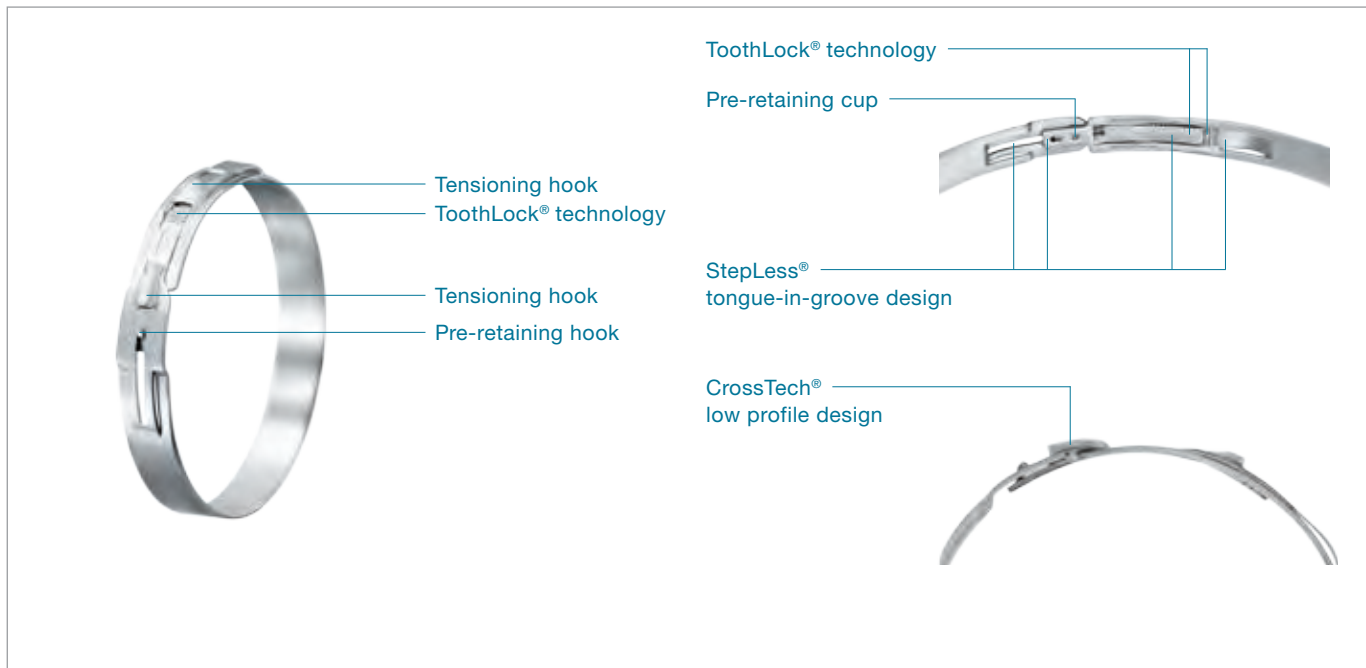
- + Fast and simple assembly
- + High radial forces

Compact:

- + Lightweight
- + Miniature sizes

Solid closure:

- + Fast and simple assembly
- + Safe connections for low pressure applications



ToothLock® technology: very high and permanent compression, superior radial load performance, highly pressure and expansion resistant

CrossTech®: ultra low profile design, very low imbalance on rotating parts

StepLess®: uniform compression, powerful all-round seal, withstands thermal stress, shock- and vibration-resistant

Burr-free strip edges: reduced risk of damage to parts being clamped

Pre-retaining cup: visual clamp closure verification

Assembly-friendly and reliable: extended diameter range, time-saving and process reliable assembly

ToothLock® Low Profile Clamp 292

Target applications

Drive shafts (CVJ boots made from TPE)

Other applications upon verification by Oetiker

Material

Stainless Steel, Material no. 1.4301/UNS S30400

Corrosion resistance according to DIN EN ISO 9227

≥ 1000 hours

Size range

width x thickness

57.5 – 118.0 mm

10.0 x 1.0 mm

Sizes

Diameter graduation 0.5 mm

Some sizes are only available if an appropriate minimum quantity is ordered.

ToothLock®

Interlocked with its teeth, the distinctive ToothLock® feature offers extremely high and permanent compression rates and outstanding expansion resistance – strong enough for the toughest connections. It also resists shock and vibration and helps the clamp to

withstand thermal stress. The ToothLock® is designed as a self-locking mechanism that provides superior performance. With its multiple tooth-locking positions, it compensates for component tolerances.

CrossTech®

The innovative CrossTech® feature is highly space-efficient and provides an ultra low profile design for a very low imbalance on rotating parts.

Tensioning Hooks

The tensioning hooks are the features used to close the ToothLock® Low Profile Clamp. An Oetiker assembly tool engages both tensioning hooks, and reduces the clamp diameter until the predefined closing force is reached.

Clamp Selection

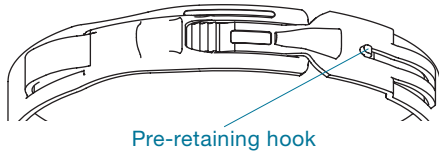
ToothLock® Low Profile Clamp sizes are determined using the largest and smallest diameter in the working range. Ideally the compressed diameter of the parts being clamped should be in the middle of the working range.

Assembly

Closing position – visual clamp closure indicators

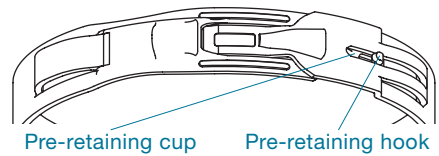
As supplied

The pre-retaining hook is engaged in the supplied condition. Teeth are visible.



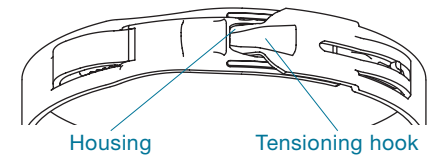
Maximum diameter in working range

The pre-retaining cup becomes visible and the teeth are no longer visible.



Minimum diameter in working range and nominal diameter

The tensioning hook is almost in contact with the housing.



Working range

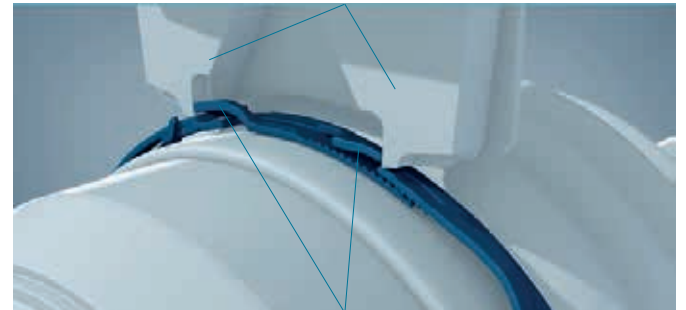
The working range of the ToothLock® Low Profile Clamp is only functional between the minimum and the maximum diameter amounting to a 2.5 mm diameter range. The as supplied diameter is 4.2 mm larger than the minimum diameter, thus offering a large overall diameter range.

Assembly Recommendations

This clamp can be installed using a manual clamping tool with torque wrench or with the Electronically Controlled Pneumatic Pincer – ELK 02 – for high volume installations as well as for process reliable installations. By using the ELK 02 complete process monitoring is available, including 100% data recording.

Assembly Instructions

Pincer jaws (cutaway)



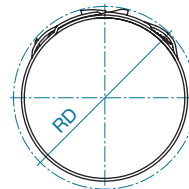
Tensioning hooks

To close a clamp, the pincer jaws must be engaged with both tensioning hooks. By operating either the ELK 02 or closing the manual pincer, the simultaneous movement of the two tensioning hooks reduces the diameter of the ToothLock® Low Profile Clamp.

Rotation diameter

The rotation diameter (RD) of an assembled clamp can be a critical design parameter for applications that rotate in close proximity to adjacent components.

$$RD = \text{closed inside diameter} + 8.7 \text{ mm}$$



Installation data

| Material dimension | Size range | Maximum closing force | Installation tools force-monitored | |
|--------------------|-----------------|-----------------------|------------------------------------|---------------------------|
| | | | Manual | Electronically controlled |
| 10 x 1.0 mm | 57.5 – 120.5 mm | 3900 N | Clamping tool and torque wrench | HO EL 5000 |

Important note

The closing force is intended as a guide, which may vary depending on the type and tolerances of parts being clamped. To ensure optimum clamp selection, we recommend conducting functional tests with several assemblies.

Order information 292

| Item No. | Ref. No. | As supplied- Ø (mm) | Working range (mm) | | Item No. | Ref. No. | As supplied- Ø (mm) | Working range (mm) | |
|----------|-------------|------------------------|--------------------|--------|----------|-------------|------------------------|--------------------|--------|
| | | | Min.-Ø* | Max.-Ø | | | | Min.-Ø* | Max.-Ø |
| 29200000 | 057.5-1010R | 61.7 | 57.5 | 60 | 29200092 | 080.5-1010R | 84.7 | 80.5 | 83 |
| 29200002 | 058.0-1010R | 62.2 | 58 | 60.5 | 29200094 | 081.0-1010R | 85.2 | 81 | 83.5 |
| 29200004 | 058.5-1010R | 62.7 | 58.5 | 61 | 29200096 | 081.5-1010R | 85.7 | 81.5 | 84 |
| 29200006 | 059.0-1010R | 63.2 | 59 | 61.5 | 29200098 | 082.0-1010R | 86.2 | 82 | 84.5 |
| 29200008 | 059.5-1010R | 63.7 | 59.5 | 62 | 29200100 | 082.5-1010R | 86.7 | 82.5 | 85 |
| 29200010 | 060.0-1010R | 64.2 | 60 | 62.5 | 29200102 | 083.0-1010R | 87.2 | 83 | 85.5 |
| 29200012 | 060.5-1010R | 64.7 | 60.5 | 63 | 29200104 | 083.5-1010R | 87.7 | 83.5 | 86 |
| 29200014 | 061.0-1010R | 65.2 | 61 | 63.5 | 29200106 | 084.0-1010R | 88.2 | 84 | 86.5 |
| 29200016 | 061.5-1010R | 65.7 | 61.5 | 64 | 29200108 | 084.5-1010R | 88.7 | 84.5 | 87 |
| 29200018 | 062.0-1010R | 66.2 | 62 | 64.5 | 29200110 | 085.0-1010R | 89.2 | 85 | 87.5 |
| 29200020 | 062.5-1010R | 66.7 | 62.5 | 65 | 29200112 | 085.5-1010R | 89.7 | 85.5 | 88 |
| 29200022 | 063.0-1010R | 67.2 | 63 | 65.5 | 29200114 | 086.0-1010R | 90.2 | 86 | 88.5 |
| 29200024 | 063.5-1010R | 67.7 | 63.5 | 66 | 29200116 | 086.5-1010R | 90.7 | 86.5 | 89 |
| 29200026 | 064.0-1010R | 68.2 | 64 | 66.5 | 29200118 | 087.0-1010R | 91.2 | 87 | 89.5 |
| 29200028 | 064.5-1010R | 68.7 | 64.5 | 67 | 29200120 | 087.5-1010R | 91.7 | 87.5 | 90 |
| 29200030 | 065.0-1010R | 69.2 | 65 | 67.5 | 29200122 | 088.0-1010R | 92.2 | 88 | 90.5 |
| 29200032 | 065.5-1010R | 69.7 | 65.5 | 68 | 29200124 | 088.5-1010R | 92.7 | 88.5 | 91 |
| 29200034 | 066.0-1010R | 70.2 | 66 | 68.5 | 29200126 | 089.0-1010R | 93.2 | 89 | 91.5 |
| 29200036 | 066.5-1010R | 70.7 | 66.5 | 69 | 29200128 | 089.5-1010R | 93.7 | 89.5 | 92 |
| 29200038 | 067.0-1010R | 71.2 | 67 | 69.5 | 29200130 | 090.0-1010R | 94.2 | 90 | 92.5 |
| 29200040 | 067.5-1010R | 71.7 | 67.5 | 70 | 29200132 | 090.5-1010R | 94.7 | 90.5 | 93 |
| 29200042 | 068.0-1010R | 72.2 | 68 | 70.5 | 29200134 | 091.0-1010R | 95.2 | 91 | 93.5 |
| 29200044 | 068.5-1010R | 72.7 | 68.5 | 71 | 29200136 | 091.5-1010R | 95.7 | 91.5 | 94 |
| 29200046 | 069.0-1010R | 73.2 | 69 | 71.5 | 29200138 | 092.0-1010R | 96.2 | 92 | 94.5 |
| 29200048 | 069.5-1010R | 73.7 | 69.5 | 72 | 29200140 | 092.5-1010R | 96.7 | 92.5 | 95 |
| 29200050 | 070.0-1010R | 74.2 | 70 | 72.5 | 29200142 | 093.0-1010R | 97.2 | 93 | 95.5 |
| 29200052 | 070.5-1010R | 74.7 | 70.5 | 73 | 29200144 | 093.5-1010R | 97.7 | 93.5 | 96 |
| 29200054 | 071.0-1010R | 75.2 | 71 | 73.5 | 29200146 | 094.0-1010R | 98.2 | 94 | 96.5 |
| 29200056 | 071.5-1010R | 75.7 | 71.5 | 74 | 29200148 | 094.5-1010R | 98.7 | 94.5 | 97 |
| 29200058 | 072.0-1010R | 76.2 | 72 | 74.5 | 29200150 | 095.0-1010R | 99.2 | 95 | 97.5 |
| 29200060 | 072.5-1010R | 76.7 | 72.5 | 75 | 29200152 | 095.5-1010R | 99.7 | 95.5 | 98 |
| 29200062 | 073.0-1010R | 77.2 | 73 | 75.5 | 29200154 | 096.0-1010R | 100.2 | 96 | 98.5 |
| 29200064 | 073.5-1010R | 77.7 | 73.5 | 76 | 29200156 | 096.5-1010R | 100.7 | 96.5 | 99 |
| 29200066 | 074.0-1010R | 78.2 | 74 | 76.5 | 29200158 | 097.0-1010R | 101.2 | 97 | 99.5 |
| 29200068 | 074.5-1010R | 78.7 | 74.5 | 77 | 29200160 | 097.5-1010R | 101.7 | 97.5 | 100 |
| 29200070 | 075.0-1010R | 79.2 | 75 | 77.5 | 29200162 | 098.0-1010R | 102.2 | 98 | 100.5 |
| 29200072 | 075.5-1010R | 79.7 | 75.5 | 78 | 29200164 | 098.5-1010R | 102.7 | 98.5 | 101 |
| 29200074 | 076.0-1010R | 80.2 | 76 | 78.5 | 29200166 | 099.0-1010R | 103.2 | 99 | 101.5 |
| 29200076 | 076.5-1010R | 80.7 | 76.5 | 79 | 29200168 | 099.5-1010R | 103.7 | 99.5 | 102 |
| 29200078 | 077.0-1010R | 81.2 | 77 | 79.5 | 29200170 | 100.0-1010R | 104.2 | 100 | 102.5 |
| 29200080 | 077.5-1010R | 81.7 | 77.5 | 80 | 29200172 | 100.5-1010R | 104.7 | 100.5 | 103 |
| 29200082 | 078.0-1010R | 82.2 | 78 | 80.5 | 29200174 | 101.0-1010R | 105.2 | 101 | 103.5 |
| 29200084 | 078.5-1010R | 82.7 | 78.5 | 81 | 29200176 | 101.5-1010R | 105.7 | 101.5 | 104 |
| 29200086 | 079.0-1010R | 83.2 | 79 | 81.5 | 29200178 | 102.0-1010R | 106.2 | 102 | 104.5 |
| 29200088 | 079.5-1010R | 83.7 | 79.5 | 82 | 29200180 | 102.5-1010R | 106.7 | 102.5 | 105 |
| 29200090 | 080.0-1010R | 84.2 | 80 | 82.5 | 29200182 | 103.0-1010R | 107.2 | 103 | 105.5 |

The data in this catalog are based on many years experience. They are intended for reference, not as design specifications.

| Item No. | Ref. No. | As supplied- Ø (mm) | Working range (mm) | |
|----------|-------------|------------------------|--------------------|--------|
| | | | Min.-Ø* | Max.-Ø |
| 29200184 | 103.5-1010R | 107.7 | 103.5 | 106 |
| 29200186 | 104.0-1010R | 108.2 | 104 | 106.5 |
| 29200188 | 104.5-1010R | 108.7 | 104.5 | 107 |
| 29200190 | 105.0-1010R | 109.2 | 105 | 107.5 |
| 29200192 | 105.5-1010R | 109.7 | 105.5 | 108 |
| 29200194 | 106.0-1010R | 110.2 | 106 | 108.5 |
| 29200196 | 106.5-1010R | 110.7 | 106.5 | 109 |
| 29200198 | 107.0-1010R | 111.2 | 107 | 109.5 |
| 29200200 | 107.5-1010R | 111.7 | 107.5 | 110 |
| 29200202 | 108.0-1010R | 112.2 | 108 | 110.5 |
| 29200204 | 108.5-1010R | 112.7 | 108.5 | 111 |
| 29200206 | 109.0-1010R | 113.2 | 109 | 111.5 |
| 29200208 | 109.5-1010R | 113.7 | 109.5 | 112 |
| 29200210 | 110.0-1010R | 114.2 | 110 | 112.5 |
| 29200212 | 110.5-1010R | 114.7 | 110.5 | 113 |
| 29200214 | 111.0-1010R | 115.2 | 111 | 113.5 |
| 29200216 | 111.5-1010R | 115.7 | 111.5 | 114 |
| 29200218 | 112.0-1010R | 116.2 | 112 | 114.5 |
| 29200220 | 112.5-1010R | 116.7 | 112.5 | 115 |
| 29200222 | 113.0-1010R | 117.2 | 113 | 115.5 |
| 29200224 | 113.5-1010R | 117.7 | 113.5 | 116 |
| 29200226 | 114.0-1010R | 118.2 | 114 | 116.5 |
| 29200228 | 114.5-1010R | 118.7 | 114.5 | 117 |
| 29200230 | 115.0-1010R | 119.2 | 115 | 117.5 |
| 29200232 | 115.5-1010R | 119.7 | 115.5 | 118 |
| 29200234 | 116.0-1010R | 120.2 | 116 | 118.5 |
| 29200236 | 116.5-1010R | 120.7 | 116.5 | 119 |
| 29200238 | 117.0-1010R | 121.2 | 117 | 119.5 |
| 29200240 | 117.5-1010R | 121.7 | 117.5 | 120 |
| 29200242 | 118.0-1010R | 122.2 | 118 | 120.5 |

* Min.-Ø = Nominal-Ø diameter marked on clamp

Assembly Tools

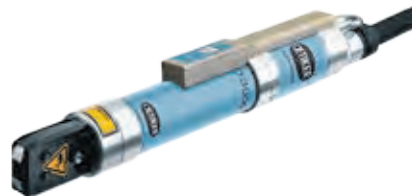
Manual

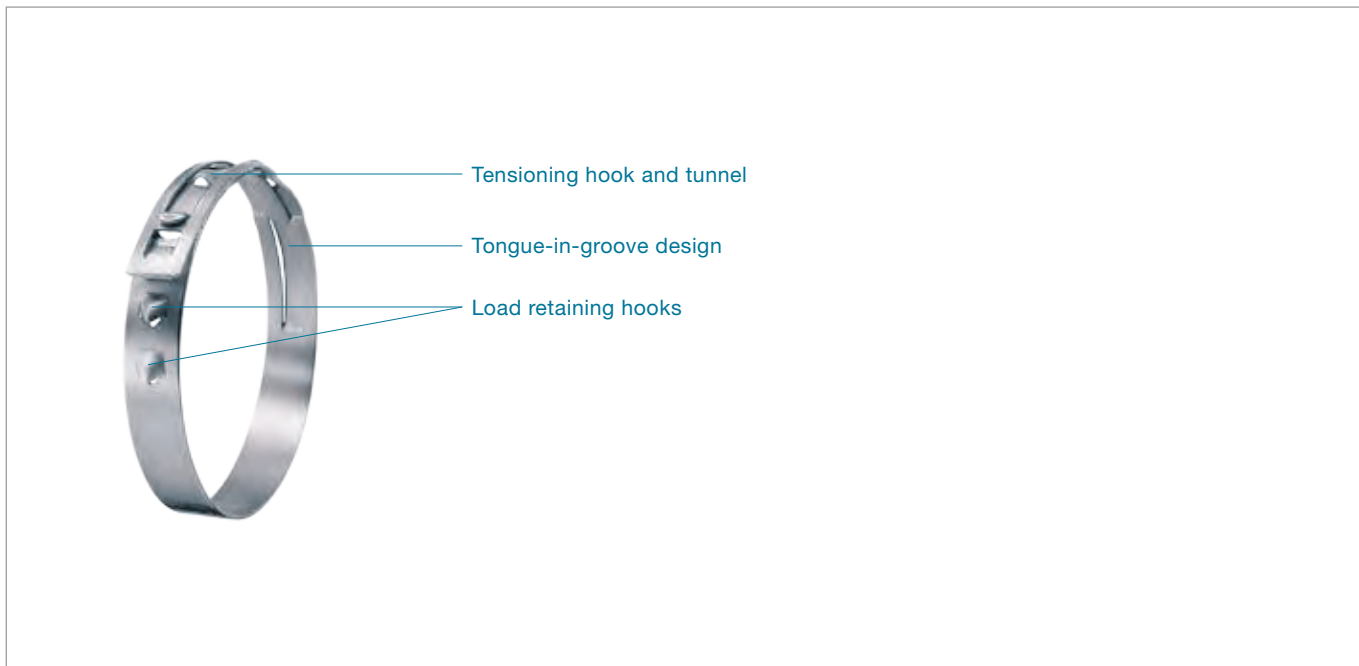
| | |
|-------------------|-------------------|
| Clamping tool 292 | Item No. 14100378 |
| Torque wrench | Item No. 14100098 |



Force-monitored: Electronically controlled

| | |
|---------------------------------|-------------------|
| HO 5000 ELT w/o pincer head | Item No. 13900339 |
| HO 5000 EL w/o pincer head | Item No. 13900234 |
| Pincer head HO-10.5-32.3-77° EL | Item No. 13900847 |
| Replacement-jaw kit | Item No. 13900848 |
| Calibration set | Item No. 13900942 |





Reusability: can be repeatedly opened and re-assembled

360° StepLess®: uniform 360° compression and constant surface pressure

Low assembled height: minimum space requirement, low imbalance on rotating parts

Load retaining hooks: visual indication that clamp is correctly assembled

Burr-free strip edges: reduced risk of damage to parts being clamped

StepLess® Low Profile Clamp 168

Material

168 Stainless steel, Material no. 1.4301 or UNS S30400

Alternative materials available on request.

Corrosion resistance according to DIN EN ISO 9227

168 ≥ 1000 h

Series

| Nominal diameter | width x thickness |
|------------------|-------------------|
| 10.5 – 19.0 mm | 9.0 x 0.5 mm |
| 19.5 – 110.0 mm | 7.0 x 0.6 mm |
| 25.0 – 110.0 mm | 9.0 x 0.6 mm |
| 60.0 – 120.5 mm | 10.0 x 0.6 mm |

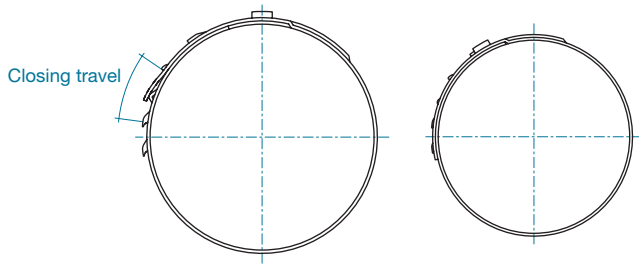
Some sizes are only available if an appropriate minimum quantity is ordered.

StepLess® Low Profile Clamps are produced in several nominal widths and thicknesses. The dimensions of the material used for the standard range are determined taking into account the required radial force, the nature of the application and the need to maintain sealing and/or retaining properties under the specified conditions and environmental exposure. When selecting the clamp diameter, the dimensions of the mating components on which the clamp is to be assembled must be accurately established to enable effective clamping performance. The durometer hardness of the soft material and the desired compression are important factors when calculating the appropriate clamp diameter.

Tensioning hook and tunnel

With the use of an Oetiker assembly tool, the clamp is reduced in diameter until the interlock position is achieved. The diameter reduction of the clamp is proportional to the closing travel. The theoretical maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{Closing travel}}{\pi}$$



Assembly Recommendations

Using a hand tool, or a pneumatic tool specifically designed for high volume production, locate the jaw tips in the tensioning hook and tunnel.

Activating the pneumatic tool, or closing the hand tool, simultaneously draws the two features together, reducing the inside diameter of the clamp. To maintain this reduced diameter, the apertures are depressed over the load retaining hooks and the applied load exerted by the tool is released, so that the hooks engage in the appropriate apertures.

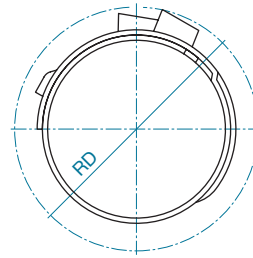
The StepLess® Low Profile Clamp provides a constant, accurate, inside diameter after assembly, but, unlike StepLess® Ear Clamps 167, will not compensate for variations in component tolerance or accommodate the effects of thermal expansion.

The sealing pressure beneath the clamp is dependent on the compression factor established when determining the appropriate clamp diameter and the resistance to thermal “set” of the soft material.

Complete process monitoring, including 100% documentation is available using the Electronically controlled pneumatic power tool Oetiker ELK (see chapter Assembly Tools).

Rotation diameter

The rotation diameter (RD) of an assembled clamp can be critical design information for applications that rotate in close proximity to adjacent components. The following list gives rotation diameters for various band sizes and product designs:



- RD for 905RWV = inside diameter +7.2 mm
- RD for 706R = inside diameter +6.0 mm
- RD for 906R = inside diameter +6.0 mm
- RD for 1006R = inside diameter +6.3 mm

Reuseability

Oetiker StepLess® Low Profile Clamps are reusable. They can be repeatedly opened and re-assembled – for example in the automotive industry at maintenance and service intervals. They can be assembled both axially and radially.

Note on ordering

In contrast to ear clamps, StepLess® Low Profile Clamps are identified with the nominal closed diameter, e.g. 195 for a closed and assembled diameter of 19.5 mm.

| Material dimensions | Manual pincer* | Recommended pneumatic pincer** |
|---------------------|----------------|--------------------------------|
| 9 x 0.5 mm | 14100030 | HO 3000 |
| 7 x 0.6 mm | 14100030 | HO 3000 |
| 9 x 0.6 mm | 14100030 | HO 3000 |
| 10 x 0.6 mm | 14100030 | HO 3000 |

* 14100030 Manual pincer for StepLess® Low Profile Clamps 7 mm, 9 mm and 10 mm wide

** With appropriate pincer head

Order information

| Item No. | Ref. No. | Ø upon delivery (mm) | Ø nominal, closed (mm) |
|--|-------------|----------------------|------------------------|
| Band width 9 mm, thickness 0.5 mm (905RWV) | | | |
| 16800561 | 0105-905RWV | 13.3 | 10.5 |
| 16800562 | 0110-905RWV | 13.8 | 11 |
| 16800563 | 0115-905RWV | 14.3 | 11.5 |
| 16800564 | 0120-905RWV | 14.8 | 12 |
| 16800565 | 0125-905RWV | 15.3 | 12.5 |
| 16800566 | 0130-905RWV | 15.8 | 13 |
| 16800567 | 0135-905RWV | 16.3 | 13.5 |
| 16800568 | 0140-905RWV | 16.8 | 14 |
| 16800569 | 0145-905RWV | 17.3 | 14.5 |
| 16800570 | 0150-905RWV | 17.8 | 15 |
| 16800571 | 0155-905RWV | 18.3 | 15.5 |
| 16800572 | 0160-905RWV | 18.8 | 16 |
| 16800573 | 0165-905RWV | 19.3 | 16.5 |
| 16800574 | 0170-905RWV | 19.8 | 17 |
| 16802321 | 0175-905RWV | 20.3 | 17.5 |
| 16800575 | 0180-905RWV | 20.8 | 18 |
| 16803070 | 0185-905RWV | 21.3 | 18.5 |
| 16800576 | 0190-905RWV | 21.8 | 19 |

Band width 7 mm, thickness 0.6 mm (706R)

| | | | |
|----------|-----------|------|------|
| 16800278 | 0600-706R | 64.4 | 60 |
| 16800279 | 0605-706R | 64.9 | 60.5 |
| 16800281 | 0610-706R | 65.4 | 61 |
| 16800282 | 0615-706R | 65.9 | 61.5 |
| 16800283 | 0620-706R | 66.4 | 62 |
| 16800284 | 0625-706R | 66.9 | 62.5 |
| 16800285 | 0630-706R | 67.4 | 63 |
| 16800286 | 0635-706R | 67.9 | 63.5 |
| 16800287 | 0640-706R | 68.4 | 64 |
| 16800288 | 0645-706R | 68.9 | 64.5 |
| 16800289 | 0650-706R | 69.4 | 65 |
| 16800290 | 0655-706R | 69.9 | 65.5 |
| 16800291 | 0660-706R | 70.4 | 66 |
| 16800292 | 0665-706R | 70.9 | 66.5 |
| 16800293 | 0670-706R | 71.4 | 67 |
| 16800294 | 0675-706R | 71.9 | 67.5 |
| 16800295 | 0680-706R | 72.4 | 68 |
| 16800296 | 0685-706R | 72.9 | 68.5 |
| 16800297 | 0690-706R | 73.4 | 69 |
| 16800298 | 0695-706R | 73.9 | 69.5 |
| 16800299 | 0700-706R | 74.4 | 70 |
| 16800300 | 0705-706R | 74.9 | 70.5 |
| 16800301 | 0710-706R | 75.4 | 71 |
| 16800302 | 0715-706R | 75.9 | 71.5 |
| 16800303 | 0720-706R | 76.4 | 72 |
| 16800304 | 0725-706R | 76.9 | 72.5 |
| 16800305 | 0730-706R | 77.4 | 73 |
| 16800306 | 0735-706R | 77.9 | 73.5 |
| 16800307 | 0740-706R | 78.4 | 74 |
| 16800308 | 0745-706R | 78.9 | 74.5 |
| 16800309 | 0750-706R | 79.4 | 75 |
| 16800310 | 0755-706R | 79.9 | 75.5 |
| 16800311 | 0760-706R | 80.4 | 76 |

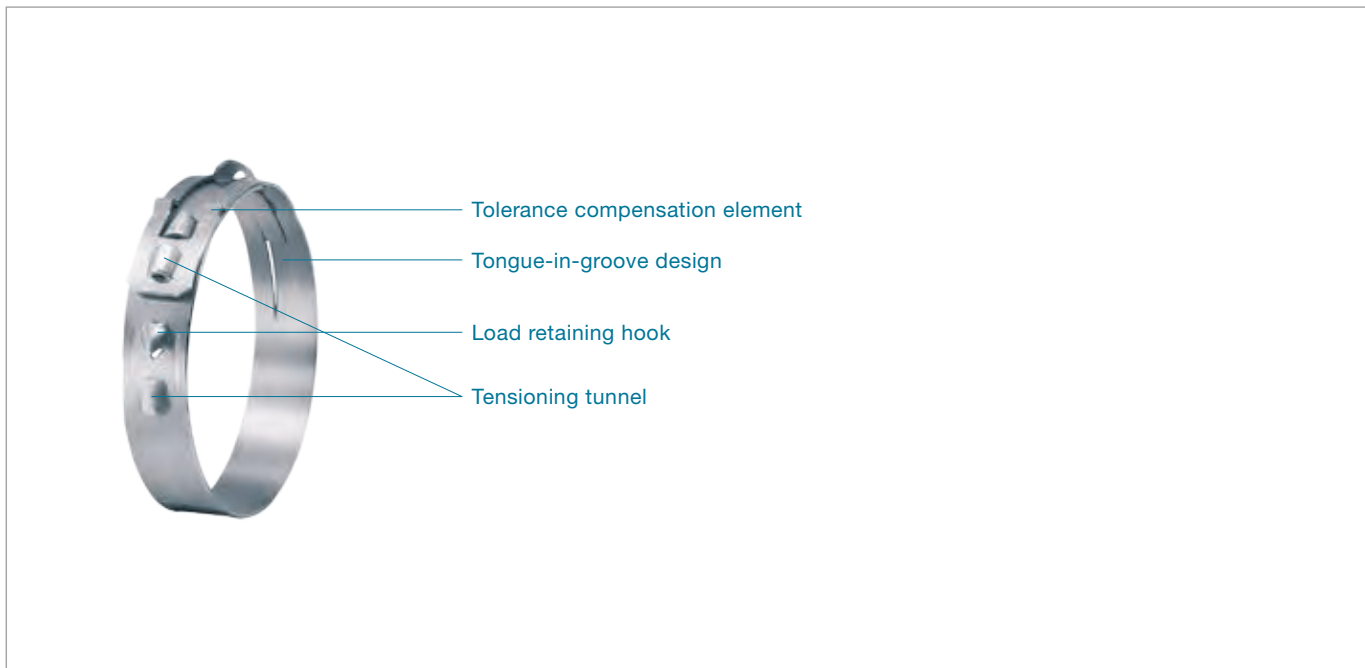
| Item No. | Ref. No. | Ø upon delivery (mm) | Ø nominal, closed (mm) |
|--|-----------|----------------------|------------------------|
| Band width 7 mm, thickness 0.6 mm (706R) | | | |
| 16800312 | 0765-706R | 80.9 | 76.5 |
| 16800313 | 0770-706R | 81.4 | 77 |
| 16800314 | 0775-706R | 81.9 | 77.5 |
| 16800315 | 0780-706R | 82.4 | 78 |
| 16800316 | 0785-706R | 82.9 | 78.5 |
| 16800317 | 0790-706R | 83.4 | 79 |
| 16800318 | 0795-706R | 83.9 | 79.5 |
| 16800319 | 0800-706R | 84.4 | 80 |
| 16800320 | 0805-706R | 84.9 | 80.5 |
| 16800321 | 0810-706R | 85.4 | 81 |
| 16800322 | 0815-706R | 85.9 | 81.5 |
| 16800323 | 0820-706R | 86.4 | 82 |
| 16800324 | 0825-706R | 86.9 | 82.5 |
| 16800325 | 0830-706R | 87.4 | 83 |
| 16800326 | 0835-706R | 87.9 | 83.5 |
| 16800327 | 0840-706R | 88.4 | 84 |
| 16800328 | 0845-706R | 88.9 | 84.5 |
| 16800329 | 0850-706R | 89.4 | 85 |
| 16800330 | 0855-706R | 89.9 | 85.5 |
| 16800331 | 0860-706R | 90.4 | 86 |
| 16800332 | 0865-706R | 90.9 | 86.5 |
| 16800333 | 0870-706R | 91.4 | 87 |
| 16800334 | 0875-706R | 91.9 | 87.5 |
| 16800335 | 0880-706R | 92.4 | 88 |
| 16800336 | 0885-706R | 92.9 | 88.5 |
| 16800337 | 0890-706R | 93.4 | 89 |
| 16800338 | 0895-706R | 93.9 | 89.5 |
| 16800339 | 0900-706R | 94.4 | 90 |
| 16800340 | 0905-706R | 94.9 | 90.5 |
| 16800341 | 0910-706R | 95.4 | 91 |
| 16800342 | 0915-706R | 95.9 | 91.5 |
| 16800343 | 0920-706R | 96.4 | 92 |
| 16800344 | 0925-706R | 96.9 | 92.5 |
| 16800345 | 0930-706R | 97.4 | 93 |
| 16800346 | 0935-706R | 97.9 | 93.5 |
| 16800347 | 0940-706R | 98.4 | 94 |
| 16800348 | 0945-706R | 98.9 | 94.5 |
| 16800349 | 0950-706R | 99.4 | 95 |
| 16800350 | 0955-706R | 99.9 | 95.5 |
| 16800351 | 0960-706R | 100.4 | 96 |
| 16800352 | 0965-706R | 100.9 | 96.5 |
| 16800353 | 0970-706R | 101.4 | 97 |
| 16800354 | 0975-706R | 101.9 | 97.5 |
| 16800355 | 0980-706R | 102.4 | 98 |
| 16800356 | 0985-706R | 102.9 | 98.5 |
| 16800357 | 0990-706R | 103.4 | 99 |
| 16800358 | 0995-706R | 103.9 | 99.5 |
| 16800359 | 1000-706R | 104.4 | 100 |
| 16800360 | 1005-706R | 104.9 | 100.5 |
| 16800361 | 1010-706R | 105.4 | 101 |
| 16800362 | 1015-706R | 105.9 | 101.5 |
| 16800363 | 1020-706R | 106.4 | 102 |
| 16800364 | 1025-706R | 106.9 | 102.5 |
| 16800365 | 1030-706R | 107.4 | 103 |

Order information

| Item No. | Ref. No. | Ø upon delivery (mm) | Ø nominal, closed (mm) |
|--|-----------|----------------------|------------------------|
| Band width 7 mm, thickness 0.6 mm (706R) | | | |
| 16800366 | 1035-706R | 107.9 | 103.5 |
| 16800367 | 1040-706R | 108.4 | 104 |
| 16800368 | 1045-706R | 108.9 | 104.5 |
| 16800369 | 1050-706R | 109.4 | 105 |
| 16800370 | 1055-706R | 109.9 | 105.5 |
| 16800371 | 1060-706R | 110.4 | 106 |
| 16800372 | 1065-706R | 110.9 | 106.5 |
| 16800373 | 1070-706R | 111.4 | 107 |
| 16800374 | 1075-706R | 111.9 | 107.5 |
| 16800375 | 1080-706R | 112.4 | 108 |
| 16800376 | 1085-706R | 112.9 | 108.5 |
| 16800377 | 1090-706R | 113.4 | 109 |
| 16800378 | 1095-706R | 113.9 | 109.5 |
| 16800379 | 1100-706R | 114.4 | 110 |

Available on request (Diameter graduation 0.5 mm)

| Item No. | Ref. No. | Size range (mm) |
|--|----------|-----------------|
| Band width 7 mm, thickness 0.6 mm (706R) | | |
| On request | | 19.5 ... 59.5 |
| Band width 9 mm, thickness 0.6 mm (906R) | | |
| On request | | 25.0 ... 110.0 |
| Band width 10 mm, thickness 0.6 mm (1006R) | | |
| On request | | 60.0 ... 120.5 |



Tolerance compensation: provides a degree of compensation for component tolerances

Reusability: can be repeatedly opened and re-assembled

360° StepLess®: uniform 360° compression and constant surface pressure

Low assembled height: minimum space requirement, low imbalance on rotating parts

Burr-free strip edges: reduced risk of damage to parts being clamped

StepLess® Low Profile Clamp with tolerance compensation 168

Material

168 Stainless steel, Material no. 1.4301/UNS S30400

Alternative materials on request.

Corrosion resistance according to DIN EN ISO 9227

168 ≥ 1000 h

Series

| Nominal diameter | width x thickness |
|------------------|-------------------|
| 19.5 – 110.0 mm | 9.0 x 0.6 mm |

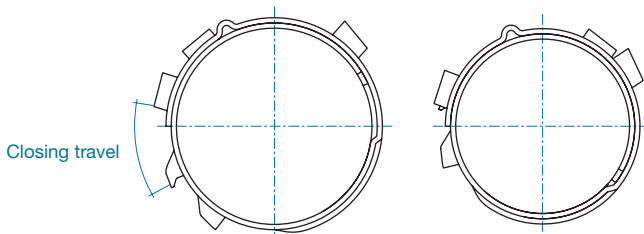
Some sizes are only available if an appropriate minimum quantity is ordered. StepLess® Low Profile Clamps with tolerance compensation are available in one standard band dimension.

When selecting the clamp diameter, the dimensions of mating components on which the clamp is to be assembled must be accurately established to enable effective clamping. The durometer hardness of the soft material and desired compression are important factors when determining the appropriate clamp diameter.

Tensioning tunnels

By using an Oetiker closing tool and applying it at the tensioning tunnels, the clamp is reduced in diameter until the load-retaining hook is located within the tunnel and engages with the leading edge. The diameter reduction of the clamp is proportional to the closing travel, but slightly influenced by elongation of the tolerance-compensation element under high loads. The theoretical maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{Closing travel}}{\pi}$$



Tolerance compensation

The tolerance-compensating elements come into effect when the nominal diameter of the closed clamp cannot be achieved due to adjacent components being at the upper levels of the tolerance range. When parts being clamped have high durometer hardness values, the compensating element can be fully elongated providing the closed position is still achievable.

For optimum performance, a clamp diameter should be selected based on the theoretical lower tolerance limits of the components. Then, when the larger dimensional assembly is encountered, the tolerance compensation element is elongated to absorb the increased diameter and allow the load-retaining hook to engage in the tensioning tunnel. The application configuration, the physical properties of the materials being sealed and the required retention, are all critical factors when determining the overall functionality of the connection

Assembly Recommendations

These clamps can be closed manually using a specially developed hand tool, or a pneumatic pincer when large quantities are to be assembled. To close the clamp, the tips of the pincer jaws must be inserted in the tensioning tunnel at the end of the overlap and in the tunnel next to the load-retaining hook. Operation of the closing tool reduces the diameter of the clamp to the position at which engagement of the closing hook occurs.

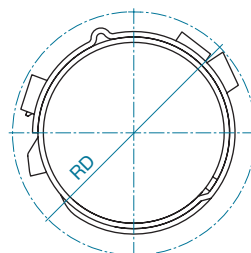
The design of StepLess® Low Profile Clamps with tolerance compensation is such that the inner contour of the tensioning tunnel on the end of the overlap, automatically engages with the load retaining hook when the correct position is achieved. In contrast to StepLess® low-profile clamps without tolerance compensation, they have the ability to accommodate minor variations in component tolerances during assembly and absorb diameter changes due to thermal expansion and contraction within the range of the compensating element.

As with other types of clamp, the sealing pressure beneath a clamp is a factor of the diameters and materials of the components under compression. The sealing properties of these clamps depends significantly on the opposing forces generated in the soft material of parts being secured, and the pre-loading of the tolerance-compensation element.

Complete process monitoring, including 100% documentation is available using the Electronically controlled pneumatic pincer ELK.

Rotation diameter

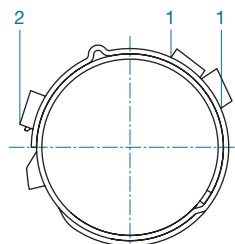
The StepLess® Low Profile Clamp with tolerance compensation has a low radial height, and was specifically developed for applications where space is restricted, while taking into account the need to accommodate the tolerances of parts being connected.



RD for 906RT8 = inside diameter +7.4 mm

Reusability

Oetiker StepLess® Low Profile Clamps with tolerance compensation are reusable to a limited extent. They can be repeatedly opened and re-assembled – for example in the automotive industry at maintenance and service intervals. They can be assembled both axially and radially. To open a clamp, the pincer must be fitted to the two tunnels (1) and squeezed. The applied force has the effect of slightly reducing the diameter of the clamp, enabling the hook to disengage from the tensioning tunnel (2) on the overlapping end.



Note on ordering

In contrast to ear clamps, StepLess® Low Profile Clamps are identified with the nominal closed diameter, e.g. 195 for a closed and assembled diameter of 19.5 mm.

| Material dimensions | Manual pincer* | Recommended pneumatic pincer** |
|---------------------|----------------|--------------------------------|
| 9 x 0.6 mm | 14100109 | HO 3000 |

* 14100109 Manual pincer for StepLess® Low Profile Clamps with tolerance compensation

** With appropriate pincer head

Order information

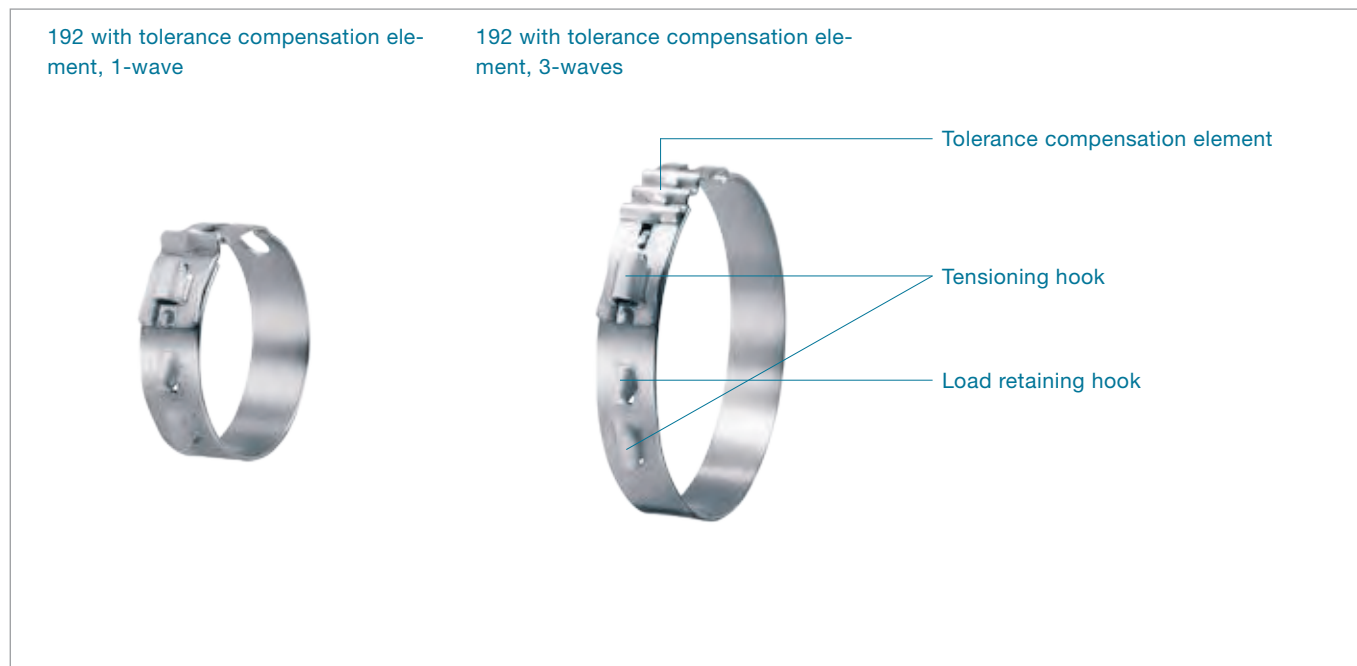
| Item No. | Ref. No. | Ø upon delivery (mm) | Ø nominal, closed (mm) |
|--|-------------|----------------------|------------------------|
| Band width 9 mm, thickness 0.6 mm (906RT8) | | | |
| 16802113 | 0195-906RT8 | 22 | 19.5 |
| 16802114 | 0200-906RT8 | 22.5 | 20 |
| 16802115 | 0205-906RT8 | 23 | 20.5 |
| 16802116 | 0210-906RT8 | 23.5 | 21 |
| 16802117 | 0215-906RT8 | 24 | 21.5 |
| 16802118 | 0220-906RT8 | 24.5 | 22 |
| 16802119 | 0225-906RT8 | 25 | 22.5 |
| 16802120 | 0230-906RT8 | 25.5 | 23 |
| 16802121 | 0235-906RT8 | 26 | 23.5 |
| 16802122 | 0240-906RT8 | 26.5 | 24 |
| 16802123 | 0245-906RT8 | 27 | 24.5 |
| 16802124 | 0250-906RT8 | 27.5 | 25 |
| 16802125 | 0255-906RT8 | 28 | 25.5 |
| 16802126 | 0260-906RT8 | 28.5 | 26 |
| 16802127 | 0265-906RT8 | 29 | 26.5 |
| 16802128 | 0270-906RT8 | 29.5 | 27 |
| 16802129 | 0275-906RT8 | 30 | 27.5 |
| 16802130 | 0280-906RT8 | 30.5 | 28 |
| 16802131 | 0285-906RT8 | 31 | 28.5 |
| 16802132 | 0290-906RT8 | 31.5 | 29 |
| 16802133 | 0295-906RT8 | 32 | 29.5 |
| 16802134 | 0300-906RT8 | 32.5 | 30 |
| 16802135 | 0305-906RT8 | 33 | 30.5 |
| 16802136 | 0310-906RT8 | 33.5 | 31 |
| 16802137 | 0315-906RT8 | 34 | 31.5 |
| 16802138 | 0320-906RT8 | 34.5 | 32 |
| 16802139 | 0325-906RT8 | 35 | 32.5 |
| 16802140 | 0330-906RT8 | 35.5 | 33 |
| 16802141 | 0335-906RT8 | 36 | 33.5 |
| 16802142 | 0340-906RT8 | 36.5 | 34 |
| 16802143 | 0345-906RT8 | 37 | 34.5 |
| 16802144 | 0350-906RT8 | 37.5 | 35 |
| 16802145 | 0355-906RT8 | 38 | 35.5 |
| 16802146 | 0360-906RT8 | 38.5 | 36 |
| 16802147 | 0365-906RT8 | 39 | 36.5 |
| 16802148 | 0370-906RT8 | 39.5 | 37 |
| 16802149 | 0375-906RT8 | 40 | 37.5 |
| 16802150 | 0380-906RT8 | 40.5 | 38 |
| 16802151 | 0385-906RT8 | 41 | 38.5 |
| 16802152 | 0390-906RT8 | 41.5 | 39 |
| 16802153 | 0395-906RT8 | 42 | 39.5 |
| 16802154 | 0400-906RT8 | 42.5 | 40 |
| 16802155 | 0405-906RT8 | 43 | 40.5 |
| 16802156 | 0410-906RT8 | 43.5 | 41 |
| 16802157 | 0415-906RT8 | 44 | 41.5 |
| 16802158 | 0420-906RT8 | 44.5 | 42 |
| 16802159 | 0425-906RT8 | 45 | 42.5 |
| 16802160 | 0430-906RT8 | 45.5 | 43 |
| 16802161 | 0435-906RT8 | 46 | 43.5 |
| 16802162 | 0440-906RT8 | 46.5 | 44 |
| 16802163 | 0445-906RT8 | 47 | 44.5 |
| 16802164 | 0450-906RT8 | 47.5 | 45 |
| 16802165 | 0455-906RT8 | 48 | 45.5 |
| 16802166 | 0460-906RT8 | 48.5 | 46 |
| 16802167 | 0465-906RT8 | 49 | 46.5 |
| 16802168 | 0470-906RT8 | 49.5 | 47 |
| 16802169 | 0475-906RT8 | 50 | 47.5 |

| Item No. | Ref. No. | Ø upon delivery (mm) | Ø nominal, closed (mm) |
|--|-------------|----------------------|------------------------|
| Band width 9 mm, thickness 0.6 mm (906RT8) | | | |
| 16802170 | 0480-906RT8 | 50.5 | 48 |
| 16802171 | 0485-906RT8 | 51 | 48.5 |
| 16802172 | 0490-906RT8 | 51.5 | 49 |
| 16802173 | 0495-906RT8 | 52 | 49.5 |
| 16802174 | 0500-906RT8 | 52.5 | 50 |
| 16802175 | 0505-906RT8 | 53 | 50.5 |
| 16802176 | 0510-906RT8 | 53.5 | 51 |
| 16802177 | 0515-906RT8 | 54 | 51.5 |
| 16802178 | 0520-906RT8 | 54.5 | 52 |
| 16802179 | 0525-906RT8 | 55 | 52.5 |
| 16802180 | 0530-906RT8 | 55.5 | 53 |
| 16802181 | 0535-906RT8 | 56 | 53.5 |
| 16802182 | 0540-906RT8 | 56.5 | 54 |
| 16802183 | 0545-906RT8 | 57 | 54.5 |
| 16802184 | 0550-906RT8 | 57.5 | 55 |
| 16802185 | 0555-906RT8 | 58 | 55.5 |
| 16802186 | 0560-906RT8 | 58.5 | 56 |
| 16802187 | 0565-906RT8 | 59 | 56.5 |
| 16802188 | 0570-906RT8 | 59.5 | 57 |
| 16802189 | 0575-906RT8 | 60 | 57.5 |
| 16802190 | 0580-906RT8 | 60.5 | 58 |
| 16802191 | 0585-906RT8 | 61 | 58.5 |
| 16802192 | 0590-906RT8 | 61.5 | 59 |
| 16801880 | 0595-906RT8 | 62 | 59.5 |
| 16802193 | 0600-906RT8 | 62.5 | 60 |
| 16802194 | 0605-906RT8 | 63 | 60.5 |
| 16802195 | 0610-906RT8 | 63.5 | 61 |
| 16802196 | 0615-906RT8 | 64 | 61.5 |
| 16802197 | 0620-906RT8 | 64.5 | 62 |
| 16802198 | 0625-906RT8 | 65 | 62.5 |
| 16802199 | 0630-906RT8 | 65.5 | 63 |
| 16802200 | 0635-906RT8 | 66 | 63.5 |
| 16802201 | 0640-906RT8 | 66.5 | 64 |
| 16802202 | 0645-906RT8 | 67 | 64.5 |
| 16801881 | 0650-906RT8 | 67.5 | 65 |
| 16802203 | 0655-906RT8 | 68 | 65.5 |
| 16802204 | 0660-906RT8 | 68.5 | 66 |
| 16802205 | 0665-906RT8 | 69 | 66.5 |
| 16802206 | 0670-906RT8 | 69.5 | 67 |
| 16802207 | 0675-906RT8 | 70 | 67.5 |
| 16802208 | 0680-906RT8 | 70.5 | 68 |
| 16802209 | 0685-906RT8 | 71 | 68.5 |
| 16802210 | 0690-906RT8 | 71.5 | 69 |
| 16802211 | 0695-906RT8 | 72 | 69.5 |
| 16802212 | 0700-906RT8 | 72.5 | 70 |
| 16802213 | 0705-906RT8 | 73 | 70.5 |
| 16802214 | 0710-906RT8 | 73.5 | 71 |
| 16802215 | 0715-906RT8 | 74 | 71.5 |
| 16802216 | 0720-906RT8 | 74.5 | 72 |
| 16802217 | 0725-906RT8 | 75 | 72.5 |
| 16802218 | 0730-906RT8 | 75.5 | 73 |
| 16802219 | 0735-906RT8 | 76 | 73.5 |
| 16802220 | 0740-906RT8 | 76.5 | 74 |
| 16802221 | 0745-906RT8 | 77 | 74.5 |
| 16802222 | 0750-906RT8 | 77.5 | 75 |
| 16802223 | 0755-906RT8 | 78 | 75.5 |
| 16802224 | 0760-906RT8 | 78.5 | 76 |

Order information

| Item No. | Ref. No. | Ø upon delivery (mm) | Ø nominal, closed (mm) |
|--|-------------|----------------------|------------------------|
| Band width 9 mm, thickness 0.6 mm (906RT8) | | | |
| 16802225 | 0765-906RT8 | 79 | 76.5 |
| 16802226 | 0770-906RT8 | 79.5 | 77 |
| 16802227 | 0775-906RT8 | 80 | 77.5 |
| 16802228 | 0780-906RT8 | 80.5 | 78 |
| 16802229 | 0785-906RT8 | 81 | 78.5 |
| 16802230 | 0790-906RT8 | 81.5 | 79 |
| 16802231 | 0795-906RT8 | 82 | 79.5 |
| 16802232 | 0800-906RT8 | 82.5 | 80 |
| 16802233 | 0805-906RT8 | 83 | 80.5 |
| 16802234 | 0810-906RT8 | 83.5 | 81 |
| 16802235 | 0815-906RT8 | 84 | 81.5 |
| 16802236 | 0820-906RT8 | 84.5 | 82 |
| 16802237 | 0825-906RT8 | 85 | 82.5 |
| 16802238 | 0830-906RT8 | 85.5 | 83 |
| 16802239 | 0835-906RT8 | 86 | 83.5 |
| 16802240 | 0840-906RT8 | 86.5 | 84 |
| 16802241 | 0845-906RT8 | 87 | 84.5 |
| 16802242 | 0850-906RT8 | 87.5 | 85 |
| 16802243 | 0855-906RT8 | 88 | 85.5 |
| 16802244 | 0860-906RT8 | 88.5 | 86 |
| 16802112 | 0865-906RT8 | 89 | 86.5 |
| 16802245 | 0870-906RT8 | 89.5 | 87 |
| 16802246 | 0875-906RT8 | 90 | 87.5 |
| 16802247 | 0880-906RT8 | 90.5 | 88 |
| 16802248 | 0885-906RT8 | 91 | 88.5 |
| 16802249 | 0890-906RT8 | 91.5 | 89 |
| 16802250 | 0895-906RT8 | 92 | 89.5 |
| 16802251 | 0900-906RT8 | 92.5 | 90 |
| 16802252 | 0905-906RT8 | 93 | 90.5 |
| 16802253 | 0910-906RT8 | 93.5 | 91 |
| 16802254 | 0915-906RT8 | 94 | 91.5 |
| 16802255 | 0920-906RT8 | 94.5 | 92 |
| 16802256 | 0925-906RT8 | 95 | 92.5 |
| 16802257 | 0930-906RT8 | 95.5 | 93 |
| 16802258 | 0935-906RT8 | 96 | 93.5 |
| 16802259 | 0940-906RT8 | 96.5 | 94 |
| 16802260 | 0945-906RT8 | 97 | 94.5 |
| 16802261 | 0950-906RT8 | 97.5 | 95 |
| 16802262 | 0955-906RT8 | 98 | 95.5 |
| 16802263 | 0960-906RT8 | 98.5 | 96 |
| 16802264 | 0965-906RT8 | 99 | 96.5 |
| 16802265 | 0970-906RT8 | 99.5 | 97 |
| 16802266 | 0975-906RT8 | 100 | 97.5 |
| 16802267 | 0980-906RT8 | 100.5 | 98 |
| 16802268 | 0985-906RT8 | 101 | 98.5 |
| 16802269 | 0990-906RT8 | 101.5 | 99 |
| 16802270 | 0995-906RT8 | 102 | 99.5 |
| 16802271 | 1000-906RT8 | 102.5 | 100 |
| 16802412 | 1005-906RT8 | 103 | 100.5 |
| 16802404 | 1010-906RT8 | 103.5 | 101 |
| 16802418 | 1015-906RT8 | 104 | 101.5 |
| 16802419 | 1020-906RT8 | 104.5 | 102 |
| 16803030 | 1025-906RT8 | 105 | 102.5 |
| 16803031 | 1030-906RT8 | 105.5 | 103 |
| 16803032 | 1035-906RT8 | 106 | 103.5 |
| 16803033 | 1040-906RT8 | 106.5 | 104 |
| 16803034 | 1045-906RT8 | 107 | 104.5 |

| Item No. | Ref. No. | Ø upon delivery (mm) | Ø nominal, closed (mm) |
|--|-------------|----------------------|------------------------|
| Band width 9 mm, thickness 0.6 mm (906RT8) | | | |
| 16803035 | 1050-906RT8 | 107.5 | 105 |
| 16803036 | 1055-906RT8 | 108 | 105.5 |
| 16803037 | 1060-906RT8 | 108.5 | 106 |
| 16803038 | 1065-906RT8 | 109 | 106.5 |
| 16802617 | 1070-906RT8 | 109.5 | 107 |
| 16803039 | 1075-906RT8 | 110 | 107.5 |
| 16803040 | 1080-906RT8 | 110.5 | 108 |
| 16803041 | 1085-906RT8 | 111 | 108.5 |
| 16803042 | 1090-906RT8 | 111.5 | 109 |
| 16803043 | 1095-906RT8 | 112 | 109.5 |
| 16803044 | 1100-906RT8 | 112.5 | 110 |



Tolerance compensation elements: allow for variations in component tolerances and temperature variations

360° StepLess®: uniform 360° compression and constant surface pressure

Low assembled height: minimum space requirement, low imbalance on rotating parts

Novel tensioning hook design: fast and simple assembly, high radial force

Burr-free strip edges: reduced risk of damage to parts being clamped

StepLess® Low Profile Clamp 192

Material

192 Stainless Steel, Material no. 1.4301/UNS S30400

Corrosion resistance according to DIN EN ISO 9227

192 ≥ 1000 h

Series

| Nominal diameter | width x thickness | tol. element |
|------------------|-------------------|--------------|
| 19.5 – 60.0 mm | 10.0 x 0.8 mm | 1-wave |
| 40.0 – 120.5 mm | 10.0 x 0.8 mm | 3-waves |

Available in 0.5 mm diameter graduations on request.

Specific diameters can only be supplied when an appropriate minimum quantity is ordered.

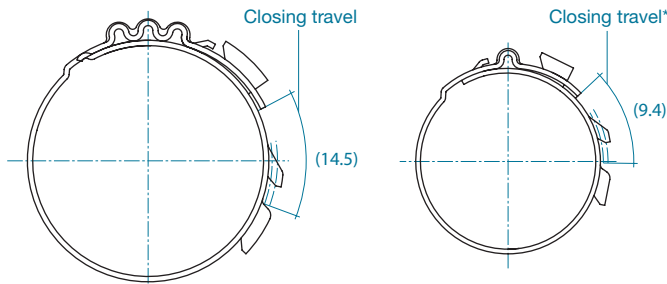
Oetiker StepLess® Low Profile Clamps 192 are produced with 1-wave and 3-wave tolerance compensation elements. The dimensions of the material used within the standard range are determined taking into account the required radial force, the nature of the application and the need to maintain sealing and/or retaining properties under the specified conditions and environmental exposure. When selecting the clamp diameter, the dimensions of the mating components on which the clamp is to be assembled must be accurately established to enable effective clamping performance. The durometer hardness of the soft material and desired compression are significant factors when calculating the appropriate clamp diameter.

Tensioning hooks

The tensioning hooks are the features used to close the StepLess® Low Profile Clamp 192. An Oetiker closing tool engages in both tensioning features, and tool movement reduces the clamp diameter until the internal cavity of the tensioning hook on the overlapping band fully engages in the load-retaining hook.

The diameter reduction of the clamp is substantially proportional to the closing travel, but subject to slight variations, depending on the degree to which tolerance compensation is required and the required radial force. The theoretical maximum reduction in diameter is given by the formula:

$$\text{Max. diameter reduction} = \frac{\text{Closing travel}}{\pi}$$



* Optionally available with enlarged as-supplied diameter (greater closing travel)

Tolerance compensation

The tolerance compensation waves are activated when the compressed diameter of the application is greater than the nominal diameter of the clamp. When the resistance against the clamp exceeds the strength of the formed convolutes, elongation occurs to enable successful engagement of the tensioning and retaining hooks.

The flexible effect of the convolutes has the potential to accommodate diameter changes due to the effects of temperature changes and vibration.

As a rule, the nominal diameter of an Oetiker StepLess® Low Profile Clamp 192 should be selected to enable the optimum hose or seal compression at the minimum assembly diameter. In the event of a maximum assembly installation, the convolutes must be capable of elongating to absorb the diameter increase while maintaining the ability to achieve the interlock engagement, taking into account the maximum permitted pincer force and the amount of elongation the convolutes can withstand.

The capability of the tolerance-compensation element, the properties and dimensional tolerance of the materials being joined all directly affect the overall functionality of the connection.

Assembly Recommendations

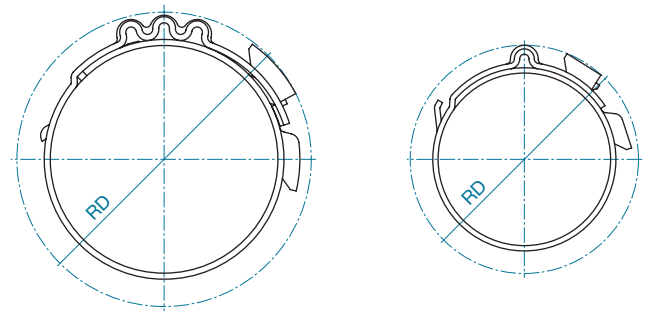
These clamps can be assembled using manual pincers especially developed for this clamp design or, alternatively, pneumatic pincers for high volume installation. To close a clamp, the pincer jaws must be engaged within both tensioning hooks. By operating the pneumatic tool or closing the manual pincer, the simultaneous movement of the two tensioning hooks reduces the diameter of the StepLess® Low Profile Clamp 192 until the effective closed diameter is achieved. The geometry of the StepLess® Low Profile Clamp 192 is such that, on reaching this position, the internal contour of the tensioning hook on the overlapping end of the clamp engages automatically in the load retaining hook.

The surface pressure generated depends on the selection criteria, especially the diameter and materials of the parts being clamped. Sealing performance is derived mainly from the restoring force of the compressed elastic material combined with tension from the tolerance-compensation elements.

Complete process monitoring, including 100% documentation is available using the Electronically controlled pneumatic pincer ELK.

Rotation diameter

The rotation diameter (RD) of an assembled clamp can be critical design information for applications that rotate in close proximity to adjacent components.



Accurate Information regarding rotation diameter can be provided on request.

Note on ordering

In contrast to ear clamps, StepLess® Low Profile Clamps are identified with the nominal closed diameter, e.g. 195 for a closed and assembled diameter of 19.5 mm.

| Material dimensions | Manual pincer* | Recommended pneumatic pincer** |
|---------------------|----------------|--------------------------------|
| 10.0 x 0.8 mm | 14100134 | HO 5000 EL / HO 7000 EL |

* 14100134 Manual pincer for StepLess® Low Profile Clamps 192.

** With appropriate pincer head and closing force setting.

Please provide us with appropriate sample parts and comprehensive information about the application.

Order information

| Item No. | Ø upon delivery (mm) | Ø nominal, closed (mm) * |
|----------|----------------------|--------------------------|
|----------|----------------------|--------------------------|

Tolerance compensation element 1-wave
Band width 10 mm, thickness 0.8 mm

| | | |
|----------|------|------|
| 19200686 | 22.5 | 19.5 |
| 19200684 | 23 | 20 |
| 19200685 | 23.5 | 20.5 |
| 19200688 | 24 | 21 |
| 19200733 | 24.5 | 21.5 |
| 19200734 | 25 | 22 |
| 19200244 | 25.5 | 22.5 |
| 19200245 | 26 | 23 |
| 19200255 | 26.5 | 23.5 |
| 19200263 | 27 | 24 |
| 19200368 | 27.5 | 24.5 |
| 19200369 | 28 | 25 |
| 19200370 | 28.5 | 25.5 |
| 19200371 | 29 | 26 |
| 19200372 | 29.5 | 26.5 |
| 19200253 | 30 | 27 |
| 19200322 | 30.5 | 27.5 |
| 19200373 | 31 | 28 |
| 19200374 | 31.5 | 28.5 |
| 19200268 | 32 | 29 |
| 19200375 | 32.5 | 29.5 |
| 19200376 | 33 | 30 |
| 19200377 | 33.5 | 30.5 |
| 19200378 | 34 | 31 |
| 19200379 | 34.5 | 31.5 |
| 19200380 | 35 | 32 |
| 19200381 | 35.5 | 32.5 |
| 19200333 | 36 | 33 |
| 19200335 | 36.5 | 33.5 |
| 19200382 | 37 | 34 |
| 19200383 | 37.5 | 34.5 |
| 19200332 | 38 | 35 |
| 19200384 | 38.5 | 35.5 |
| 19200385 | 39 | 36 |
| 19200386 | 39.5 | 36.5 |
| 19200358 | 40 | 37 |
| 19200387 | 40.5 | 37.5 |
| 19200388 | 41 | 38 |
| 19200389 | 41.5 | 38.5 |
| 19200390 | 42 | 39 |
| 19200391 | 42.5 | 39.5 |
| 19200392 | 43 | 40 |
| 19200393 | 43.5 | 40.5 |
| 19200394 | 44 | 41 |
| 19200395 | 44.5 | 41.5 |
| 19200396 | 45 | 42 |
| 19200397 | 45.5 | 42.5 |
| 19200398 | 46 | 43 |
| 19200399 | 46.5 | 43.5 |

| Item No. | Ø upon delivery (mm) | Ø nominal, closed (mm) * |
|----------|----------------------|--------------------------|
|----------|----------------------|--------------------------|

Tolerance compensation element 1-wave
Band width 10 mm, thickness 0.8 mm

| | | |
|----------|------|------|
| 19200400 | 47 | 44 |
| 19200401 | 47.5 | 44.5 |
| 19200402 | 48 | 45 |
| 19200403 | 48.5 | 45.5 |
| 19200404 | 49 | 46 |
| 19200405 | 49.5 | 46.5 |
| 19200406 | 50 | 47 |
| 19200407 | 50.5 | 47.5 |
| 19200408 | 51 | 48 |
| 19200409 | 51.5 | 48.5 |
| 19200410 | 52 | 49 |
| 19200411 | 52.5 | 49.5 |
| 19200412 | 53 | 50 |
| 19200413 | 53.5 | 50.5 |
| 19200414 | 54 | 51 |
| 19200415 | 54.5 | 51.5 |
| 19200416 | 55 | 52 |
| 19200417 | 55.5 | 52.5 |
| 19200418 | 56 | 53 |
| 19200419 | 56.5 | 53.5 |
| 19200420 | 57 | 54 |
| 19200421 | 57.5 | 54.5 |
| 19200422 | 58 | 55 |
| 19200423 | 58.5 | 55.5 |
| 19200424 | 59 | 56 |
| 19200425 | 59.5 | 56.5 |
| 19200426 | 60 | 57 |
| 19200427 | 60.5 | 57.5 |
| 19200428 | 61 | 58 |
| 19200429 | 61.5 | 58.5 |
| 19200430 | 62 | 59 |
| 19200431 | 62.5 | 59.5 |
| 19200432 | 63 | 60 |

| Item No. | Ø upon delivery (mm) | Ø nominal, closed (mm) * |
|----------|----------------------|--------------------------|
|----------|----------------------|--------------------------|

Tolerance compensation element 3-waves
Band width 10 mm, thickness 0.8 mm

| | | |
|----------|------|------|
| 19200454 | 44.5 | 40 |
| 19200455 | 45 | 40.5 |
| 19200350 | 45.5 | 41 |
| 19200352 | 46 | 41.5 |
| 19200456 | 46.5 | 42 |
| 19200457 | 47 | 42.5 |
| 19200458 | 47.5 | 43 |
| 19200459 | 48 | 43.5 |
| 19200460 | 48.5 | 44 |
| 19200461 | 49 | 44.5 |
| 19200462 | 49.5 | 45 |
| 19200463 | 50 | 45.5 |
| 19200464 | 50.5 | 46 |
| 19200465 | 51 | 46.5 |
| 19200466 | 51.5 | 47 |
| 19200467 | 52 | 47.5 |
| 19200468 | 52.5 | 48 |
| 19200469 | 53 | 48.5 |
| 19200470 | 53.5 | 49 |
| 19200471 | 54 | 49.5 |
| 19200472 | 54.5 | 50 |
| 19200473 | 55 | 50.5 |
| 19200474 | 55.5 | 51 |
| 19200339 | 56 | 51.5 |
| 19200340 | 56.5 | 52 |
| 19200475 | 57 | 52.5 |
| 19200476 | 57.5 | 53 |
| 19200477 | 58 | 53.5 |
| 19200478 | 58.5 | 54 |
| 19200479 | 59 | 54.5 |
| 19200480 | 59.5 | 55 |
| 19200481 | 60 | 55.5 |
| 19200482 | 60.5 | 56 |
| 19200483 | 61 | 56.5 |
| 19200484 | 61.5 | 57 |
| 19200485 | 62 | 57.5 |
| 19200486 | 62.5 | 58 |
| 19200487 | 63 | 58.5 |
| 19200488 | 63.5 | 59 |
| 19200489 | 64 | 59.5 |
| 19200490 | 64.5 | 60 |
| 19200491 | 65 | 60.5 |
| 19200492 | 65.5 | 61 |
| 19200493 | 66 | 61.5 |
| 19200494 | 66.5 | 62 |
| 19200495 | 67 | 62.5 |
| 19200496 | 67.5 | 63 |
| 19200341 | 68 | 63.5 |
| 19200342 | 68.5 | 64 |

Order information

| Item No. | Ø upon delivery (mm) | Ø nominal, closed (mm) * |
|----------|----------------------|--------------------------|
|----------|----------------------|--------------------------|

Tolerance compensation element 3-waves
Band width 10 mm, thickness 0.8 mm

| | | |
|----------|------|------|
| 19200497 | 69 | 64.5 |
| 19200498 | 69.5 | 65 |
| 19200499 | 70 | 65.5 |
| 19200500 | 70.5 | 66 |
| 19200501 | 71 | 66.5 |
| 19200502 | 71.5 | 67 |
| 19200503 | 72 | 67.5 |
| 19200504 | 72.5 | 68 |
| 19200505 | 73 | 68.5 |
| 19200506 | 73.5 | 69 |
| 19200507 | 74 | 69.5 |
| 19200508 | 74.5 | 70 |
| 19200509 | 75 | 70.5 |
| 19200510 | 75.5 | 71 |
| 19200511 | 76 | 71.5 |
| 19200512 | 76.5 | 72 |
| 19200513 | 77 | 72.5 |
| 19200514 | 77.5 | 73 |
| 19200515 | 78 | 73.5 |
| 19200516 | 78.5 | 74 |
| 19200517 | 79 | 74.5 |
| 19200518 | 79.5 | 75 |
| 19200519 | 80 | 75.5 |
| 19200520 | 80.5 | 76 |
| 19200521 | 81 | 76.5 |
| 19200522 | 81.5 | 77 |
| 19200523 | 82 | 77.5 |
| 19200524 | 82.5 | 78 |
| 19200525 | 83 | 78.5 |
| 19200526 | 83.5 | 79 |
| 19200527 | 84 | 79.5 |
| 19200528 | 84.5 | 80 |
| 19200529 | 85 | 80.5 |
| 19200530 | 85.5 | 81 |
| 19200531 | 86 | 81.5 |
| 19200532 | 86.5 | 82 |
| 19200533 | 87 | 82.5 |
| 19200534 | 87.5 | 83 |
| 19200535 | 88 | 83.5 |
| 19200536 | 88.5 | 84 |
| 19200537 | 89 | 84.5 |
| 19200538 | 89.5 | 85 |
| 19200539 | 90 | 85.5 |
| 19200540 | 90.5 | 86 |
| 19200541 | 91 | 86.5 |
| 19200542 | 91.5 | 87 |
| 19200543 | 92 | 87.5 |
| 19200544 | 92.5 | 88 |
| 19200545 | 93 | 88.5 |

| Item No. | Ø upon delivery (mm) | Ø nominal, closed (mm) * |
|----------|----------------------|--------------------------|
|----------|----------------------|--------------------------|

Tolerance compensation element 3-waves
Band width 10 mm, thickness 0.8 mm

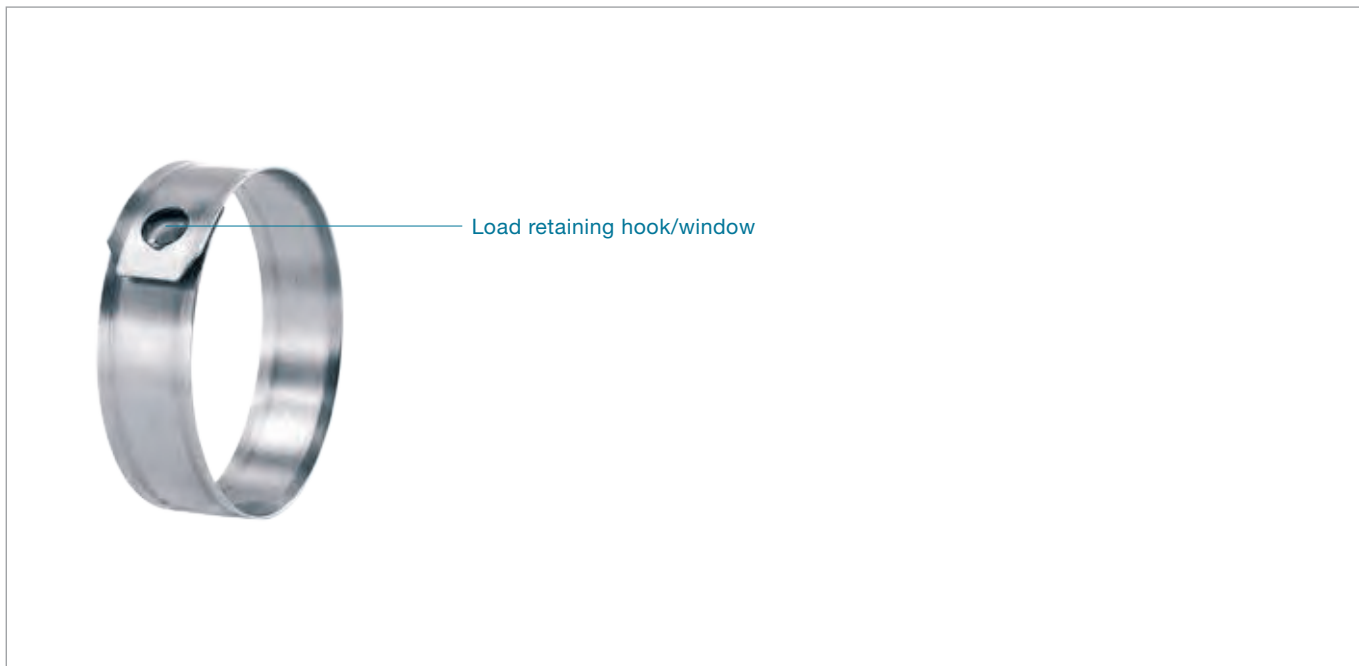
| | | |
|----------|-------|-------|
| 19200546 | 93.5 | 89 |
| 19200547 | 94 | 89.5 |
| 19200548 | 94.5 | 90 |
| 19200362 | 95 | 90.5 |
| 19200549 | 95.5 | 91 |
| 19200550 | 96 | 91.5 |
| 19200551 | 96.5 | 92 |
| 19200552 | 97 | 92.5 |
| 19200553 | 97.5 | 93 |
| 19200554 | 98 | 93.5 |
| 19200555 | 98.5 | 94 |
| 19200556 | 99 | 94.5 |
| 19200557 | 99.5 | 95 |
| 19200558 | 100 | 95.5 |
| 19200559 | 100.5 | 96 |
| 19200560 | 101 | 96.5 |
| 19200561 | 101.5 | 97 |
| 19200562 | 102 | 97.5 |
| 19200563 | 102.5 | 98 |
| 19200564 | 103 | 98.5 |
| 19200565 | 103.5 | 99 |
| 19200566 | 104 | 99.5 |
| 19200567 | 104.5 | 100 |
| 19200568 | 105 | 100.5 |
| 19200569 | 105.5 | 101 |
| 19200570 | 106 | 101.5 |
| 19200571 | 106.5 | 102 |
| 19200572 | 107 | 102.5 |
| 19200573 | 107.5 | 103 |
| 19200343 | 108 | 103.5 |
| 19200348 | 108.5 | 104 |
| 19200574 | 109 | 104.5 |
| 19200575 | 109.5 | 105 |
| 19200576 | 110 | 105.5 |
| 19200577 | 110.5 | 106 |
| 19200578 | 111 | 106.5 |
| 19200579 | 111.5 | 107 |
| 19200580 | 112 | 107.5 |
| 19200581 | 112.5 | 108 |
| 19200582 | 113 | 108.5 |
| 19200583 | 113.5 | 109 |
| 19200584 | 114 | 109.5 |
| 19200585 | 114.5 | 110 |
| 19200586 | 115 | 110.5 |
| 19200587 | 115.5 | 111 |
| 19200588 | 116 | 111.5 |
| 19200589 | 116.5 | 112 |
| 19200590 | 117 | 112.5 |
| 19200591 | 117.5 | 113 |

| Item No. | Ø upon delivery (mm) | Ø nominal, closed (mm) * |
|----------|----------------------|--------------------------|
|----------|----------------------|--------------------------|

Tolerance compensation element 3-waves
Band width 10 mm, thickness 0.8 mm

| | | |
|----------|-------|-------|
| 19200592 | 118 | 113.5 |
| 19200593 | 118.5 | 114 |
| 19200594 | 119 | 114.5 |
| 19200595 | 119.5 | 115 |
| 19200596 | 120 | 115.5 |
| 19200597 | 120.5 | 116 |
| 19200598 | 121 | 116.5 |
| 19200599 | 121.5 | 117 |
| 19200600 | 122 | 117.5 |
| 19200601 | 122.5 | 118 |
| 19200602 | 123 | 118.5 |
| 19200603 | 123.5 | 119 |
| 19200604 | 124 | 119.5 |
| 19200605 | 124.5 | 120 |
| 19200606 | 125 | 120.5 |

* Without affecting the tolerance-compensation element (free state).



Compact: **lightweight, miniature sizes**

Low assembled height: **minimum space requirement**

Solid closure: **fast and simple assembly, safe connection for low pressure applications**

Burr-free strip edges: **reduced risk of damage to parts being clamped**

Clamp ER 194

Material

194 **Stainless Steel, Material no. 1.4310/UNS S30100**

Corrosion resistance according to DIN EN ISO 9227

194 **≥ 800 h**

Series

| Size range | width x thickness |
|-----------------|-------------------|
| 4.8 – ca. 25 mm | 6.5 x 0.25 mm |

Some sizes are only available if an appropriate minimum quantity is ordered.

Oetiker ER Clamps are made from a single, standard strip dimension. The clamp diameter must be determined very accurately to ensure correct operation in service – the required radial force, the nature of the hose and the necessary sealing and retaining properties are all extremely important.

Particular attention must be paid to the compressibility and wall-thickness of the material being joined. For assistance, please contact Oetiker.

Load retaining hook

Closure is achieved when the load retaining hook engages in the load retaining window. Both hook and window have been specially developed for this type of clamp. The reduction in diameter of the Clamp ER is proportional to the closing travel, which is approx. 4 mm. The maximum diameter reduction is thus given by the following formula:

$$\text{Max. diameter reduction} = \frac{\text{Closing travel}}{\pi}$$

The very thin material, from which these clamps are made, only 0.25 mm, means that after assembly there is only a very small step where the two ends of the clamp overlap. The effect of this is that the ER Clamps exert almost uniform compression, or surface pressure, on clamped parts.

The result is effective clamping of compressible materials for all manner of applications. The sealing characteristics of Clamps ER depend on the resilience provided by the compressed elastic material of the parts joined.

Assembly Recommendations

Clamps ER can be closed using a specially-developed manual pincer, or, for large quantities, using a pneumatic pincer. To install a clamp, the diameter is reduced by jaws, which completely surround it, until the load retaining hook engages in the load retaining window in the overlapping end. No specific orientation within the tool is required prior to closure.

Note on ordering

Oetiker Clamps ER are identified with the nominal closed diameter, e.g. 6 for a closed diameter of 6 mm.

For detailed order information, please contact your local Oetiker branch.

Screw Clamps and Universal Clamps

p. 80

StepLess® Screw Clamp
178

p. 82

Worm Drive Clamp
180

p. 84

Worm Drive Clamp Mini
180



Choice of engagement positions:

- + Clamp can be adjusted to several different nominal diameters

360° StepLess®:

- + Uniform compression and uniform surface pressure

Self-tensioning:

- + Compensates for thermal cycle diameter changes

Toggle lock with intermediate position:

- + Fast and simple assembly
- + High tightening torque

Visual overload protection:

- + Protection against excessive tightening

Compact design:

- + Minimal space requirement
- + Miniature sizes

Embossed band strip:

- + Reduced risk of damage to the part being clamped

Oetiker will be pleased to help you to find the correct choice for your application. Send sample parts and all relevant information for your specific application to Oetiker, and you will receive recommendations for product type, diameter, and method of assembly.

p. 86

Universal Clamp
174

p. 90

Worm Drive Clamps
126 & 177

p. 94

Worm Drive Clamps North America
conform to SAE² J1508 Typ "F"
126 & 177



Perforated band strip:

- + Universally applicable
- + Various diameters and widths

Ratchet lock:

- + Assembly and removal without tools

Screw lock:

- + Simple assembly
- + High holding force

Durable band design:

- + Enhanced surface pressure
- + Optimized band exceeds DIN¹ 3017 standard

Reliable:

- + No damage to hose
- + Optimum sealing

Worker-friendly:

- + One size fits various diameters
- + Fast and easy service with common tool

Clamp design:

- + Perforated clamp band
- + Large clamping range
- + High holding forces

Short housing saddle:

- + Uniform force distribution and good sealing

¹ DIN = Deutsches Institut für Normung
(German Institute for Standardization)

² SAE = Society of Automotive Engineers
(only for the North American market)



Choice of engagement positions: clamp can be adjusted to several different nominal diameters

Narrow Band: concentrated transmission of clamping force, complies with SAE J1508 Type SSPC

360° StepLess®: uniform 360° compression and constant surface pressure

Burr-free strip edges: reduced risk of damage to the part being clamped

Self-tensioning: compensates for thermal cycle diameter changes

StepLess® Screw Clamp 178

Material

178 Band, spacer, retaining elements (D-nut):

Stainless Steel, Material no. 1.4301/UNS S30400

Screw: Stainless Steel, Material no. 1.4319/UNS S30200

Spring: 17-7PH (aerospace quality)

Series

| Size range | width x thickness |
|-----------------|-------------------|
| 18.0 – 255.0 mm | 9.0 x 0.6 mm |

Some sizes are only available if an appropriate minimum quantity is ordered.

Oetiker StepLess® Screw Clamps are available in two versions: Oetiker StepLess® Screw Clamps and Self-Tensioning StepLess® Screw Clamps.

Material thickness

Oetiker StepLess® Screw Clamps and Self-Tensioning StepLess® Screw Clamps are made from strip material 9 mm wide and 0.6 mm thick. The dimensions of the strip ensure optimum sealing with EPDM rubber and silicone hoses, while taking into account the necessary radial force, the compressibility of the hose, the sealing/retaining properties and the environmental conditions.

Interlock

The closure is a mechanical interlock whose function is to provide secure retention of the round clamp geometry. The interlock can be opened to permit radial assembly of the clamp, and at the same time provides a simple way of relocating the interlock features to obtain alternative diameters prior to tightening.

Positions for diameter changes

Sizes 24–42 mm

- 3 different positions
- diameter change for each step 1.6 mm

Sizes 45–55 mm

- 3 different positions
- diameter change for each step 2.1 mm

Sizes 60–255 mm

- 5 different positions
- diameter change for each step 2.0 mm

Screw: M4 x 0.7

Screw head: combination of hexagon head with cross-socket

Assembly Recommendations

1. Turn screw anti-clockwise until it stops at the “D” nut.
2. For radial assembly or change of diameter, unlatch the interlock.
3. Position the open clamp around the hose. Locate the tongue in the groove and position the apertures of the mechanical interlock over the mating features. Engage the interlock at the smallest possible diameter.
4. Tighten the screw to the required torque. Do not exceed the maximum permissible tightening torque.
5. A gap of > 3 mm should exist between the D-nuts. This ensures that there is sufficient movement for the clamp to reduce in diameter when the spring of the self-tensioning clamp expands during contraction of the hose. If the gap between the D-nuts is less than the recommended 3 mm, proceed to step 6. (Only applicable to Self-Tensioning Spring Screw Clamps).
6. Turn the screw anti-clockwise to loosen the Self-Tensioning Screw Clamp.
7. Relocate the interlock in the next smaller diameter position.
8. Tighten the screw to the required torque. Do not exceed the maximum permissible tightening torque.

Maximum average, static torque guide:

Spring without color identification (sizes 24.0–31.0 mm):

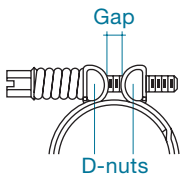
90–100 Ncm Max (8–9 inch pound-force max.)

Green spring (sizes 32.0 mm and larger):

135–200 Ncm Max (12–18 inch pound-force max.)

The values indicated above are based on maximum clamp torque capacity and common hose materials. Low durometer hardness hoses may require alternative or lower torque values and should be verified by means of product compatibility investigations.

For StepLess® Screw Clamps the minimum gap between D-nuts should be > 3mm.



Tolerance compensation with StepLess® Screw Clamps

Oetiker StepLess® Screw Clamps and Self-Tensioning StepLess® Screw Clamps should be tightened to the optimum torque as specified in the guide. This torque takes into account the required degree of compression, the necessary radial force, and the maximum torque resistance of the screw and clamp band. By using a defined and constant torque at assembly, compensation for component tolerances will always be available and the radial force will remain approximately the same.

The spring on Oetiker Self-Tensioning StepLess® Screw Clamp serves as a compensation element to accommodate changes in diameter resulting from thermal expansion and contraction or vibration. This feature gives Screw Clamps optimum sealing performance even in applications where there are strong thermal influences.

Order information

| Item No.* | Ref. No.* | Item No.** | Ref. No.** | Size range (mm) |
|-----------|-----------|------------|------------|-----------------|
|-----------|-----------|------------|------------|-----------------|

Band width 9 mm, thickness 0.6 mm

| | | | | |
|----------|-------|----------|-------|-----------|
| 17800120 | 024-9 | 17800170 | 024S9 | 18 – 24 |
| 17800122 | 028-9 | 17800172 | 028S9 | 22 – 28 |
| 17800124 | 032-9 | 17800174 | 032S9 | 26 – 32 |
| 17800125 | 036-9 | 17800175 | 036S9 | 30 – 36 |
| 17800126 | 040-9 | 17800176 | 040S9 | 34 – 40 |
| 17800127 | 045-9 | 17800177 | 045S9 | 37.5 – 45 |
| 17800128 | 050-9 | 17800178 | 050S9 | 42.5 – 50 |
| 17800129 | 055-9 | 17800179 | 055S9 | 47.5 – 55 |
| 17800130 | 060-9 | 17800180 | 060S9 | 49 – 60 |
| 17800131 | 065-9 | 17800181 | 065S9 | 54 – 65 |
| 17800132 | 070-9 | 17800182 | 070S9 | 59 – 70 |
| 17800133 | 075-9 | 17800183 | 075S9 | 64 – 75 |
| 17800134 | 080-9 | 17800184 | 080S9 | 69 – 80 |
| 17800135 | 085-9 | 17800185 | 085S9 | 74 – 85 |
| 17800136 | 090-9 | 17800186 | 090S9 | 79 – 90 |
| 17800137 | 095-9 | 17800187 | 095S9 | 84 – 95 |
| 17800138 | 100-9 | 17800188 | 100S9 | 89 – 100 |
| 17800139 | 105-9 | 17800189 | 105S9 | 94 – 105 |
| 17800140 | 110-9 | 17800190 | 110S9 | 99 – 110 |

* StepLess® Screw Clamps

** Self-Tensioning Screw Clamps

For Self-Tensioning StepLess® Screw Clamps, the minimum diameter of the clamping range is 1 mm larger than that given in the above table.

Alternative diameters on request.



Toggle lock with intermediate position: **fast and simple assembly, high tightening torque**

Visual overload protection: **protects against excessive tightening**

Hexagon socket screw SW5: **fast and safe assembly**

Alternative with wing screw: **tool integrated in the clamp**

Worm Drive Clamp 180

Material

180 W4 Band and fastener: **Stainless Steel,**

Material no. 1.4301/UNS S30400

Screw: **Stainless Steel, Material no. 1.4305/UNS S30300**

Series

| Size range | width x thickness |
|-----------------|-------------------|
| 30.0 – 500.0 mm | 12.2 x 0.9 mm |

Special sizes up to 1000 mm diameter available on request.

Some sizes are only available if an appropriate minimum quantity is ordered.

Screw Clamp design

Flap lock

After opening the body, the band can be formed by hand to approximately the clamping diameter. The flap can then be closed, and the clamp tightened by turning the screw. As a result, the screw only has to be turned for the last part of the clamping operation.

Intermediate stop

The flap is secured by an intermediate stop. Even when loosely assembled, clamps cannot open on their own accord.

Visual overload protection

The housing incorporates a web which distorts visibly above a tightening torque of 4–5 Nm (35–44 in-lbs). This visual feature indicates that a Worm Drive Clamp is optimally tightened and still has an adequate factor of safety to the maximum tightening torque.

Worm Drive Clamps with wing screw

The Worm Drive Clamp with wing screw can be assembled entirely without tools. The integral, torsionally-stiff wing provides optimum grip. The dimensions correspond to the standard design with the exception of the wing screw.

Oetiker Universal Clamp Band

The universal tension band is available in 8 or 12 mm band width, each on rolls with lengths of 10, 20, or 30 m, with a suitable lock for band widths of 8 or 12 mm.



Stainless steel universal tension band and lock.

Assembly Recommendations

For safe tightening of screw clamps without wing screws, we recommend use of a 5A/F hexagon wrench. The maximum static tightening torque is 6 Nm (53 in-lb).

Installing an Universal Worm Drive Clamp

Measure the circumference to be clamped and cut off the band to that length. Pass the end of the band, from above, through the slit in the closing element, and fold it back at least 40 mm below the band. Pass the second end of the band through the slit in the perforated part of the closing element and fold it back at least 40 mm. Lay the band around the part to be clamped, push the band end with perforation below the flap lock and close.



Tighten the clamp with a 5 A/F hexagon wrench. This system may not be entirely suitable for soft and flexible components.

Order information

| Item No. | Clamping range D (mm) |
|----------|-----------------------|
|----------|-----------------------|

Screw Clamp

Band width 12 mm, thickness 0.9 mm

| | |
|----------|-----------|
| 18000206 | 30 – 60 |
| 18000025 | 50 – 80 |
| 18000026 | 80 – 110 |
| 18000027 | 110 – 140 |
| 18000028 | 140 – 170 |
| 18000029 | 170 – 200 |
| 18000030 | 200 – 230 |
| 18000031 | 230 – 260 |
| 18000032 | 260 – 290 |
| 18000033 | 290 – 320 |
| 18000034 | 320 – 350 |

Screw Clamp with wing screw

| | |
|----------|-----------|
| 18000207 | 30 – 60 |
| 18000136 | 50 – 80 |
| 18000137 | 80 – 110 |
| 18000135 | 110 – 140 |
| 18000168 | 140 – 170 |
| 18000143 | 170 – 200 |
| 18000169 | 200 – 230 |
| 18000174 | 230 – 260 |
| 18000175 | 260 – 290 |
| 18000176 | 290 – 320 |
| 18000177 | 320 – 350 |

| Item No. | Clamping range D (mm) |
|----------|-----------------------|
|----------|-----------------------|

Universal Clamp Band

Band width 8 mm, thickness 0.5 mm

| | |
|----------|-------------------------------------|
| 18000211 | Closing element for stainless steel |
| 18000213 | Universal clamp band, roll 10 m |
| 18000214 | Universal clamp band, roll 20 m |
| 18000215 | Universal clamp band, roll 30 m |

Band width 12 mm, thickness 0.5 mm

| | |
|----------|-------------------------------------|
| 18000211 | Closing element for stainless steel |
| 18000216 | Universal clamp band, roll 10 m |
| 18000217 | Universal clamp band, roll 20 m |
| 18000218 | Universal clamp band, roll 30 m |

Worm Drive Clamps are available for a clamping range from 30 mm up to 1000 mm. Up to diameter 200 mm, Worm Drive Clamps are delivered pre-shaped, above diameter 200 mm they are supplied flat. Customer-specific sizes are available on request.



- Compact design: Minimal space requirement, miniature sizes
- Cylindrical screw head: fast, simple and safe assembly
- Embossed band strip: reduced risk of damage to the part being clamped
- Alternative with wing screw: tool integrated in the clamp

Worm Drive Clamp Mini 180

Material type R 180

- W2 Band: Rust-resistant chromium steel,
Material no. 1.4016/UNS S43000
- Screw and housing: Steel, zinc-plated, blue chromate finish

Material type Mini R+S 180

- W4 Band and fastener: Stainless Steel,
Material no. 1.4301/UNS S30400
- Screw: Stainless Steel,
Material no. 1.4305/UNS S30300

Series

| Size range | width x thickness | |
|----------------|-------------------|-----------------------|
| 7.0 – 19.0 mm | 5.0 x 0.4 mm | Type R ¹ |
| 7.0 – 219.0 mm | 5.0 x 0.4 mm | Type R+S ² |

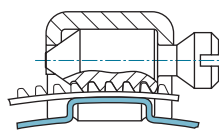
Some sizes are only available if an appropriate minimum quantity is ordered.

¹ Mini R = stainless

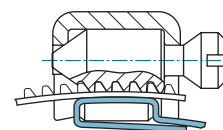
² Mini R+S = stainless and acid-proof

Clamp Design

Oetiker Mini R+S Worm Drive Clamps



Mini R+S
Sizes 1–7 band overlapping



Mini R+S
Above size 8, band reverse-bent

Oetiker Mini R Worm Drive Clamps



Open state



Round state

Assembly Recommendations

For safe tightening of screw clamps without wing screws, we recommend to use a suitable standard screwdriver.

Maximum static tightening torques:

Mini R 70 Ncm (6 in-lb)

Mini R+S/wing screw 120 Ncm (10 in-lb)

Order information

| Item No. | Type | Clamping range D (mm) |
|----------|------|-----------------------|
|----------|------|-----------------------|

Worm Drive Clamp Mini R¹

Band width 5 mm, thickness 0.4 mm

| | | |
|----------|-------------|---------|
| 18000000 | MINI R 1 | 6 – 11 |
| 18000001 | MINI R 1.5 | 7 – 15 |
| 18000002 | MINI R 2 | 11 – 19 |
| 18000248 | MINI R 1 GZ | 6 – 11 |
| 18000249 | MINI R 2 GZ | 9 – 19 |
| 18000252 | MINI 1 S | 6 – 11 |
| 18000254 | MINI 2 S | 11 – 19 |
| 18000255 | MINI 1 GS | 6 – 11 |
| 18000256 | MINI 2 GS | 9 – 19 |

S = open state with hexagon-head screw

GS = round state with hexagon-head screw

R 1, R 1.5, R 2 = open state with cylindrical screw head

R 1 GZ / R 2 GZ = round state with cylindrical screw head

Worm Drive Clamps with cylindrical screw head Mini R+S

Band width 5 mm, thickness 0.4 mm

| | | |
|----------|-------------|-----------|
| 18000003 | MINI R+S 1 | 7 – 11 |
| 18000004 | MINI R+S 2 | 11 – 19 |
| 18000005 | MINI R+S 3 | 18 – 29 |
| 18000006 | MINI R+S 4 | 28 – 39 |
| 18000007 | MINI R+S 5 | 38 – 49 |
| 18000008 | MINI R+S 6 | 48 – 59 |
| 18000009 | MINI R+S 7 | 58 – 69 |
| 18000010 | MINI R+S 8 | 68 – 79 |
| 18000011 | MINI R+S 9 | 78 – 89 |
| 18000012 | MINI R+S 10 | 88 – 99 |
| 18000013 | MINI R+S 11 | 98 – 109 |
| 18000014 | MINI R+S 12 | 108 – 119 |
| 18000015 | MINI R+S 13 | 118 – 129 |
| 18000016 | MINI R+S 14 | 128 – 139 |
| 18000017 | MINI R+S 15 | 138 – 149 |
| 18000018 | MINI R+S 16 | 148 – 159 |
| 18000019 | MINI R+S 17 | 158 – 169 |
| 18000020 | MINI R+S 18 | 168 – 179 |
| 18000021 | MINI R+S 19 | 178 – 189 |
| 18000022 | MINI R+S 20 | 188 – 199 |
| 18000023 | MINI R+S 21 | 198 – 209 |
| 18000024 | MINI R+S 22 | 208 – 219 |

| Item No. | Type | Clamping range D (mm) |
|----------|------|-----------------------|
|----------|------|-----------------------|

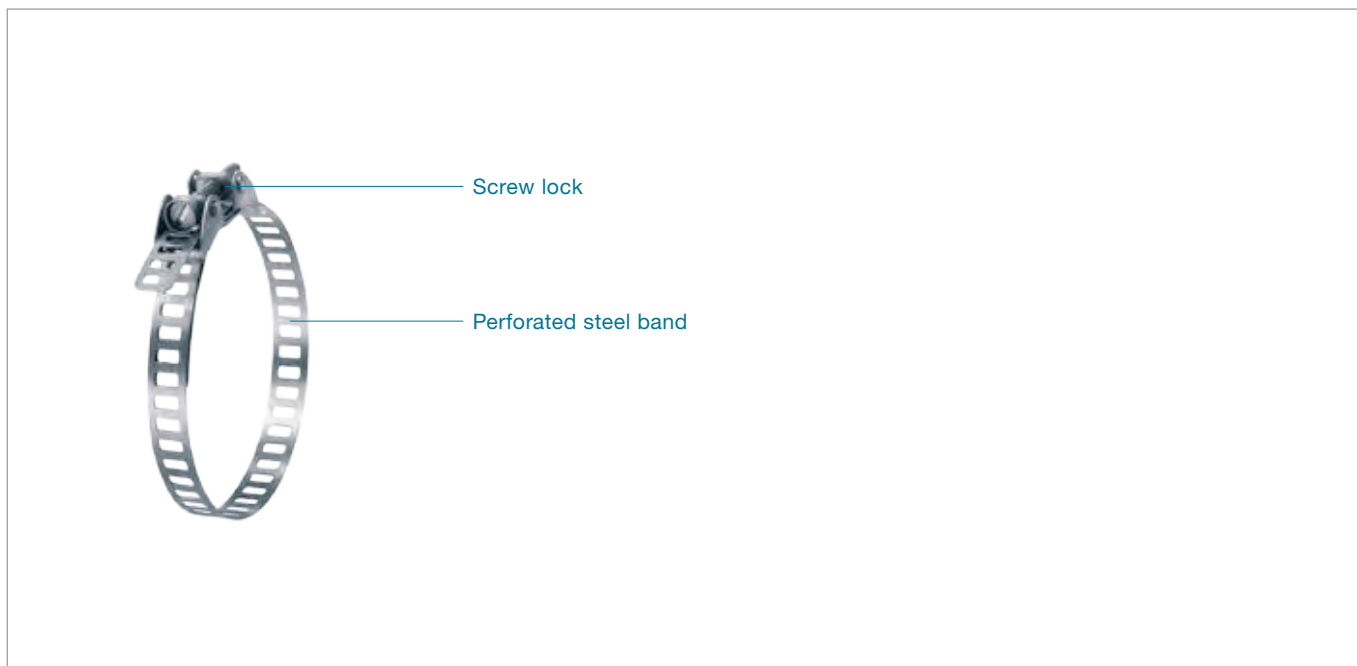
Worm Drive Clamps with wing screw Mini R+S²

Band width 5 mm, thickness 0.4 mm

| | | |
|----------|---------------|-----------|
| 18000183 | MINI R+S F 1 | 7 – 11 |
| 18000184 | MINI R+S F 2 | 11 – 19 |
| 18000185 | MINI R+S F 3 | 18 – 29 |
| 18000186 | MINI R+S F 4 | 28 – 39 |
| 18000187 | MINI R+S F 5 | 38 – 49 |
| 18000188 | MINI R+S F 6 | 48 – 59 |
| 18000189 | MINI R+S F 7 | 58 – 69 |
| 18000190 | MINI R+S F 8 | 68 – 79 |
| 18000191 | MINI R+S F 9 | 78 – 89 |
| 18000192 | MINI R+S F 10 | 88 – 99 |
| 18000193 | MINI R+S F 11 | 98 – 109 |
| 18000194 | MINI R+S F 12 | 108 – 119 |
| 18000195 | MINI R+S F 13 | 118 – 129 |
| 18000196 | MINI R+S F 14 | 128 – 139 |
| 18000197 | MINI R+S F 15 | 138 – 149 |
| 18000198 | MINI R+S F 16 | 148 – 159 |
| 18000199 | MINI R+S F 17 | 158 – 169 |
| 18000200 | MINI R+S F 18 | 168 – 179 |
| 18000201 | MINI R+S F 19 | 178 – 189 |
| 18000202 | MINI R+S F 20 | 188 – 199 |
| 18000203 | MINI R+S F 21 | 198 – 209 |
| 18000204 | MINI R+S F 22 | 208 – 219 |

¹ Mini R = stainless

² Mini R+S = stainless and acid-proof



Perforated band: universally applicable for various diameters and widths

Ratchet lock: assembly and removal without tools

Screw lock: simple assembly, high holding force

Various supply options: kit format, bulk or to customer specification

Universal Clamp 174

Material

174 All parts are stainless steel, Material no. 1.4301/ UNS S30400

Optional alternative materials

Series

| Size range | width x thickness |
|------------|-------------------|
| ≥ 35.0 mm | 10.0 x 0.5 mm |
| ≥ 80.0 mm | 18.0 x 0.8 mm* |
| ≥ 150.0 mm | 30.0 x 0.7 mm** |

* For use with 18 mm screw lock

** For use with 30 mm screw lock



Screw lock 18 mm



Ratchet lock



Perforated steel band

Clamp Design

Concept

Individual closure mechanism (screw or ratchet lock) combined with perforated steel band – clamps can be round or have an irregular form. Available as kits, in bulk or to customer's specification. Special versions are available with integral tolerance compensation and non-perforated band.

Universal clamps are available in standard widths and thicknesses. The band dimensions should be chosen to give the necessary radial force (clamping force) to ensure the required retention properties under the anticipated ambient conditions.

Assembly Recommendations

For assembly of the Screw Lock, we recommend to use a suitable flat blade screwdriver, or a socket wrench.

Static tightening torque

Screw lock for band width 10 mm: max. 3 Nm

Screw lock for band width 18 mm: max. 10 Nm

Screw lock for band width 30 mm: max. 20 Nm

Assembly instructions

Screw lock type



Determine the clamp length, e.g. wrap around object to be clamped and add approx. 50 mm.



Cut off band to required length. To avoid possible injury remove sharp edges with a file and trim corners at an angle.



Insert approximately 30 mm of band material through the top of the retaining slot and fold backwards underneath the remaining strip.



Position clamp over object. Insert free end of the band over the hooks and under the screw, protruding past the body of the screw lock. Engage the hooks in the perforations at the tightest possible position.



Tighten the clamp with a screwdriver or hexagon wrench.

Ratchet lock type



Determine the clamp length, e.g. wrap around object to be clamped and add approx. 50 mm.



Cut off band to required length. To avoid possible injury remove sharp edges with a file and trim corners at an angle.



Insert approximately 30 mm of band material through the top of the retaining slot and fold backwards underneath the remaining strip.



Place lever in open position, pre-form the end of the band to match the curvature of lock. Pass free end under tongue and through slot, so that the end extends beyond the lock body.

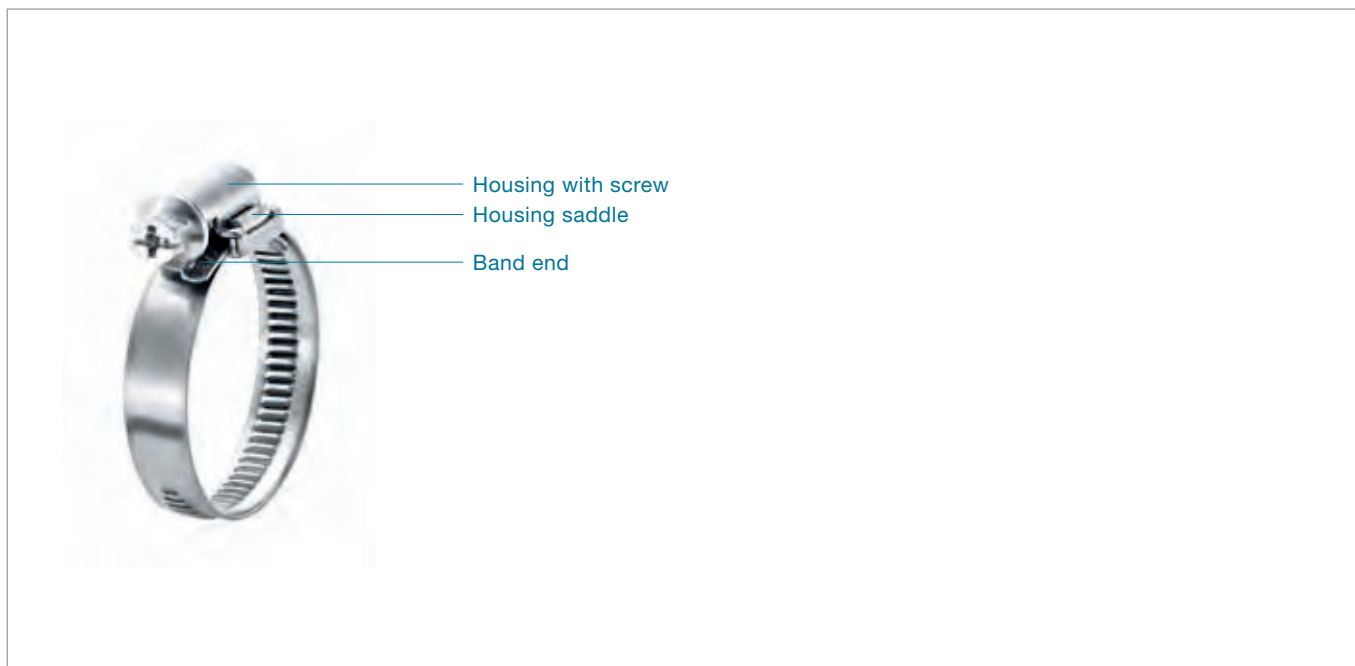


Position clamp over object. With minimal force, press free end of band steel down and ratchet the lever back and forth until tight. Firmly lock the lever down in the final retained position. "Securing dimple" prevents unintentional opening.

Order information

| Item No. | Ref. No. | Size range (mm) |
|----------------------------------|----------|-----------------|
| Screw lock | | |
| Compatible with band width 10 mm | | |
| 17400003 | 540R/10- | 40 – 100 |
| 17400002 | 540R/10+ | 100 – ... |
| Compatible with band width 18 mm | | |
| 17400005 | 540R/18- | 80 – 150 |
| 17400004 | 540R/18+ | 150 – ... |
| Compatible with band width 30 mm | | |
| 17400006 | 540R/30+ | 150 – ... |
| Ratchet lock | | |
| Compatible with band width 10 mm | | |
| 17400063 | 504R/60- | 35 – 60 |
| 17400064 | 504R/60+ | 60 – ... |

| Item No. | Ref. No. | Band length (m) |
|--|----------|-----------------|
| Perforated steel band | | |
| Width 10 mm, material thickness 0.5 mm | | |
| 17400067 | 501R/10 | 10 |
| 17400081 | 501R/20 | 20 |
| Width 18 mm, material thickness 0.8 mm | | |
| 17400077 | 518R/10 | 10 |
| 17400079 | 518R/20 | 20 |
| Steel band | | |
| Width 30 mm, material thickness 0.7 mm | | |
| 17400101 | 530R/10 | 10 |
| 17401421 | 530R/20 | 20 |



Durable: Enhanced surface pressure thanks to curled, burr-free edges
(optimized band exceeds DIN 3017 standard)

Reliable: No damage to hose thanks to curled strip with burr-free edges, optimum sealing

Worker-friendly: One size fits various diameters, fast and easy service with common screw driver or torque wrench

Worm Drive Clamps 126 & 177

High band quality. Made by Oetiker.

Material 126

W1 All parts coated steel

W2 Band and housing: stainless steel

Material No. 1.4016 / UNS S43000

Hexagon-head screw: steel, zinc-plated

Material 177

W3 All parts stainless steel

Material No. 1.4016 / UNS S43000

W4 All parts stainless steel

Material No. 1.4301 / UNS S30400

Please ask for availability.

Standard Series

| Diameter range | Width x Thickness |
|-----------------|-------------------|
| 8.0 – 32.0 mm | 9 x 0.6 mm |
| 25.0 – 160.0 mm | 9 x 0.7 mm |
| 25.0 – 390.0 mm | 12 x 0.8 mm |

Clamp design

Oetiker Worm Drive Clamps are technically advanced, multi-range hose clamps, which cover a very wide range of clamping diameters. Hoses of differing diameters can be securely connected with a single size.

Manufactured by cold-forming, the bands of these worm drive clamps have a slightly curved form. The depth of the thread impressions reduces to each side – the thread impressions have their full depth in the middle.

Worm drive clamps in material qualities W1 and W2 have a 7 A/F hexagon head screw with cross recess (Phillips). Clamps in material qualities W3 and W4 have a hexagon-head screw with a standard screwdriver slot.

Recommended installation

For professional installation, we recommend using a flexible screwdriver. This tool ensures safe installation even in hard-to-reach locations. For series installation requiring high process reliability, electronically monitored controlled-torque screwdrivers should be used.

Static tightening torque:

| Clamping range | B = 9 | B = 12 |
|----------------|-----------|-----------|
| 8 – 20 | 2 +0.5 Nm | |
| 16 – 160 | 3 +0.5 Nm | |
| 25 – 390 | | 5 +0.5 Nm |

Static test torque:

| Clamping range | B = 9 | B = 12 |
|----------------|-------------|-------------|
| 8 – 20 | max. 2.6 Nm | |
| 16 – 160 | max. 4.0 Nm | |
| 25 – 390 | | max. 6.5 Nm |

B = band width

Order information

| Item No. | Ref. No. | Size range (mm) |
|----------|----------|-----------------|
|----------|----------|-----------------|

Worm Drive Clamps W2

Band width 9 mm, thickness 0.6 mm

| | | |
|----------|--------------|---------|
| 12600451 | 09/008016 W2 | 8 – 16 |
| 12600452 | 09/012020 W2 | 12 – 20 |
| 12600453 | 09/016025 W2 | 16 – 25 |
| 12600454 | 09/020032 W2 | 20 – 32 |

Worm Drive Clamps W2

Band width 9 mm, thickness 0.7 mm

| | | |
|----------|--------------|-----------|
| 12600429 | 09/025040 W2 | 25 – 40 |
| 12600430 | 09/030045 W2 | 30 – 45 |
| 12600431 | 09/032050 W2 | 32 – 50 |
| 12600432 | 09/040060 W2 | 40 – 60 |
| 12600433 | 09/050070 W2 | 50 – 70 |
| 12600434 | 09/060080 W2 | 60 – 80 |
| 12600435 | 09/070090 W2 | 70 – 90 |
| 12600467 | 09/080100 W2 | 80 – 100 |
| 12600468 | 09/090110 W2 | 90 – 110 |
| 12600469 | 09/100120 W2 | 100 – 120 |
| 12600470 | 09/110130 W2 | 110 – 130 |
| 12600471 | 09/120140 W2 | 120 – 140 |
| 12600472 | 09/130150 W2 | 130 – 150 |
| 12600473 | 09/140160 W2 | 140 – 160 |

Other diameter ranges on request.

| Item No. | Ref. No. | Size range (mm) |
|----------|----------|-----------------|
|----------|----------|-----------------|

Worm Drive Clamps W2

Band width 12 mm, thickness 0.8 mm

| | | |
|----------|--------------|-----------|
| 12600352 | 12/025040 W2 | 25 – 40 |
| 12600339 | 12/030045 W2 | 30 – 45 |
| 12600330 | 12/032050 W2 | 32 – 50 |
| 12600450 | 12/035055 W2 | 35 – 55 |
| 12600340 | 12/040060 W2 | 40 – 60 |
| 12600354 | 12/045065 W2 | 45 – 65 |
| 12600341 | 12/050070 W2 | 50 – 70 |
| 12600444 | 12/055075 W2 | 55 – 75 |
| 12600342 | 12/060080 W2 | 60 – 80 |
| 12600343 | 12/070090 W2 | 70 – 90 |
| 12600355 | 12/075095 W2 | 75 – 95 |
| 12600338 | 12/080100 W2 | 80 – 100 |
| 12600344 | 12/090110 W2 | 90 – 110 |
| 12600345 | 12/100120 W2 | 100 – 120 |
| 12600346 | 12/110130 W2 | 110 – 130 |
| 12600347 | 12/120140 W2 | 120 – 140 |
| 12600348 | 12/130150 W2 | 130 – 150 |
| 12600349 | 12/140160 W2 | 140 – 160 |
| 12600350 | 12/150170 W2 | 150 – 170 |
| 12600351 | 12/160180 W2 | 160 – 180 |
| 12600353 | 12/170190 W2 | 170 – 190 |
| 12600395 | 12/180200 W2 | 180 – 200 |
| 12600401 | 12/190210 W2 | 190 – 210 |
| 12600396 | 12/200220 W2 | 200 – 220 |
| 12600397 | 12/210230 W2 | 210 – 230 |
| 12600400 | 12/220240 W2 | 220 – 240 |
| 12600417 | 12/230250 W2 | 230 – 250 |
| 12600398 | 12/240260 W2 | 240 – 260 |
| 12600418 | 12/250270 W2 | 250 – 270 |
| 12600460 | 12/260280 W2 | 260 – 280 |
| 12600419 | 12/270290 W2 | 270 – 290 |
| 12600443 | 12/280300 W2 | 280 – 300 |
| 12600426 | 12/290310 W2 | 290 – 310 |
| 12600399 | 12/300320 W2 | 300 – 320 |
| 12600420 | 12/350370 W2 | 350 – 370 |
| 12600421 | 12/370390 W2 | 370 – 390 |

Other diameter ranges on request.

Order information

| Item No. | Ref. No. | Size range (mm) |
|---|--------------|-----------------|
| Worm Drive Clamps W3 Band width 9 mm, thickness 0.6 mm | | |
| 17700510 | 09/008016 W3 | 8 – 16 |
| 17700511 | 09/012020 W3 | 12 – 20 |
| 17700514 | 09/016025 W3 | 16 – 25 |
| 17700515 | 09/020032 W3 | 20 – 32 |

Worm Drive Clamps W3
Band width 9 mm, thickness 0.7 mm

| | | |
|----------|--------------|-----------|
| 17700462 | 09/025040 W3 | 25 – 40 |
| 17700463 | 09/030045 W3 | 30 – 45 |
| 17700464 | 09/032050 W3 | 32 – 50 |
| 17700465 | 09/035055 W3 | 35 – 55 |
| 17700466 | 09/040060 W3 | 40 – 60 |
| 17700467 | 09/050070 W3 | 50 – 70 |
| 17700468 | 09/060080 W3 | 60 – 80 |
| 17700469 | 09/070090 W3 | 70 – 90 |
| 17700470 | 09/080100 W3 | 80 – 100 |
| 17700471 | 09/090110 W3 | 90 – 110 |
| 17700472 | 09/100120 W3 | 100 – 120 |
| 17700473 | 09/110130 W3 | 110 – 130 |
| 17700474 | 09/120140 W3 | 120 – 140 |
| 17700475 | 09/130150 W3 | 130 – 150 |
| 17700476 | 09/140160 W3 | 140 – 160 |

Other diameter ranges on request.

| Item No. | Ref. No. | Size range (mm) |
|--|--------------|-----------------|
| Worm Drive Clamps W3 Band width 12 mm, thickness 0.8 mm | | |
| 17700528 | 12/025040 W3 | 25 – 40 |
| 17700529 | 12/030045 W3 | 30 – 45 |
| 17700530 | 12/032050 W3 | 32 – 50 |
| 17700531 | 12/035055 W3 | 35 – 55 |
| 17700532 | 12/040060 W3 | 40 – 60 |
| 17700533 | 12/045065 W3 | 45 – 65 |
| 17700534 | 12/050070 W3 | 50 – 70 |
| 17700535 | 12/055075 W3 | 55 – 75 |
| 17700536 | 12/060080 W3 | 60 – 80 |
| 17700546 | 12/070090 W3 | 70 – 90 |
| 17700547 | 12/075095 W3 | 75 – 95 |
| 17700548 | 12/080100 W3 | 80 – 100 |
| 17700549 | 12/090110 W3 | 90 – 110 |
| 17700550 | 12/100120 W3 | 100 – 120 |
| 17700551 | 12/110130 W3 | 110 – 130 |
| 17700552 | 12/120140 W3 | 120 – 140 |
| 17700553 | 12/130150 W3 | 130 – 150 |
| 17700554 | 12/140160 W3 | 140 – 160 |
| 17700555 | 12/150170 W3 | 150 – 170 |
| 17700614 | 12/160180 W3 | 160 – 180 |
| 17700615 | 12/170190 W3 | 170 – 190 |
| 17700616 | 12/180200 W3 | 180 – 200 |
| 17700617 | 12/190210 W3 | 190 – 210 |
| 17700618 | 12/200220 W3 | 200 – 220 |
| 17700619 | 12/210230 W3 | 210 – 230 |
| 17700620 | 12/220240 W3 | 220 – 240 |
| 17700621 | 12/230250 W3 | 230 – 250 |
| 17700622 | 12/240260 W3 | 240 – 260 |
| 17700623 | 12/250270 W3 | 250 – 270 |
| 17700624 | 12/260280 W3 | 260 – 280 |
| 17700625 | 12/270290 W3 | 270 – 290 |
| 17700626 | 12/280300 W3 | 280 – 300 |
| 17700627 | 12/290310 W3 | 290 – 310 |
| 17700628 | 12/300320 W3 | 300 – 320 |
| 17700629 | 12/350370 W3 | 350 – 370 |
| 17700630 | 12/370390 W3 | 370 – 390 |

Other diameter ranges on request.

Order information

| Item No. | Ref. No. | Size range (mm) |
|---|--------------|-----------------|
| Worm Drive Clamps W4 Band width 9 mm, thickness 0.6 mm | | |
| 17700512 | 09/008016 W4 | 8 – 16 |
| 17700513 | 09/012020 W4 | 12 – 20 |
| 17700516 | 09/016025 W4 | 16 – 25 |
| 17700517 | 09/020032 W4 | 20 – 32 |

Worm Drive Clamps W4
Band width 9 mm, thickness 0.7 mm

| | | |
|----------|--------------|-----------|
| 17700477 | 09/025040 W4 | 25 – 40 |
| 17700478 | 09/030045 W4 | 30 – 45 |
| 17700479 | 09/032050 W4 | 32 – 50 |
| 17700480 | 09/035055 W4 | 35 – 55 |
| 17700481 | 09/040060 W4 | 40 – 60 |
| 17700482 | 09/050070 W4 | 50 – 70 |
| 17700483 | 09/060080 W4 | 60 – 80 |
| 17700484 | 09/070090 W4 | 70 – 90 |
| 17700485 | 09/080100 W4 | 80 – 100 |
| 17700486 | 09/090110 W4 | 90 – 110 |
| 17700487 | 09/100120 W4 | 100 – 120 |
| 17700488 | 09/110130 W4 | 110 – 130 |
| 17700489 | 09/120140 W4 | 120 – 140 |
| 17700490 | 09/130150 W4 | 130 – 150 |
| 17700491 | 09/140160 W4 | 140 – 160 |

Other diameter ranges on request.

| Item No. | Ref. No. | Size range (mm) |
|--|--------------|-----------------|
| Worm Drive Clamps W4 Band width 12 mm, thickness 0.8 mm | | |
| 17700537 | 12/025040 W4 | 25 – 40 |
| 17700538 | 12/030045 W4 | 30 – 45 |
| 17700539 | 12/032050 W4 | 32 – 50 |
| 17700540 | 12/035055 W4 | 35 – 55 |
| 17700541 | 12/040060 W4 | 40 – 60 |
| 17700542 | 12/045065 W4 | 45 – 65 |
| 17700543 | 12/050070 W4 | 50 – 70 |
| 17700544 | 12/055075 W4 | 55 – 75 |
| 17700545 | 12/060080 W4 | 60 – 80 |
| 17700556 | 12/070090 W4 | 70 – 90 |
| 17700557 | 12/075095 W4 | 75 – 95 |
| 17700558 | 12/080100 W4 | 80 – 100 |
| 17700559 | 12/090110 W4 | 90 – 110 |
| 17700560 | 12/100120 W4 | 100 – 120 |
| 17700561 | 12/110130 W4 | 110 – 130 |
| 17700562 | 12/120140 W4 | 120 – 140 |
| 17700563 | 12/130150 W4 | 130 – 150 |
| 17700564 | 12/140160 W4 | 140 – 160 |
| 17700565 | 12/150170 W4 | 150 – 170 |
| 17700648 | 12/160180 W4 | 160 – 180 |
| 17700649 | 12/170190 W4 | 170 – 190 |
| 17700650 | 12/180200 W4 | 180 – 200 |
| 17700651 | 12/190210 W4 | 190 – 210 |
| 17700652 | 12/200220 W4 | 200 – 220 |
| 17700653 | 12/210230 W4 | 210 – 230 |
| 17700654 | 12/220240 W4 | 220 – 240 |
| 17700655 | 12/230250 W4 | 230 – 250 |
| 17700656 | 12/240260 W4 | 240 – 260 |
| 17700657 | 12/250270 W4 | 250 – 270 |
| 17700658 | 12/260280 W4 | 260 – 280 |
| 17700659 | 12/270290 W4 | 270 – 290 |
| 17700660 | 12/280300 W4 | 280 – 300 |
| 17700661 | 12/290310 W4 | 290 – 310 |
| 17700662 | 12/300320 W4 | 300 – 320 |
| 17700663 | 12/350370 W4 | 350 – 370 |
| 17700664 | 12/370390 W4 | 370 – 390 |

Other diameter ranges on request.



Conforms to SAE J1508 Type “F” (North America): Perforated band, large clamping range

Short housing saddling: even radial load

Robust housing connection: high radial loads

High quality materials: good corrosion resistance

Worm Drive Clamps North America conform to SAE¹ J1508 Type “F” 126 & 177

Material 126

Band and housing are stainless steel materials UNS 201/301, respectively

Hex-head screw is carbon steel, zinc-plated

Material 177

Band and housing are stainless steel materials UNS 201/301, respectively

Hex-head screw is stainless steel, UNS 410

Series

| Diameter range | width x thickness |
|----------------|-------------------|
| 3/8 – 7.0 in | 1/2 x 0.025 in |
| 10 – 178 mm | 12.7 x 0.63 mm |

Other material qualities and diameter ranges on request.

Oetiker Worm Drive Clamps are suitable for numerous applications, for example for agricultural and forestry machinery, on ship and marine applications, in maintenance, repair and operations industries, etc. As a result of the generous clamping range, the same size of clamp can be used for several joint diameters.

A choice of materials to suit the application makes them a practical solution for the low and medium pressure ranges. Oetiker Worm-Drive Clamps comply fully with the requirements of SAE J1508 for Type “F” clamps.

Recommended assembly

For professional assembly, we recommend use of a flexible screwdriver. This tool ensures safe assembly even in hard-to-reach locations.

In series production where there are high process reliability requirements, use of an electronically-monitored Oetiker torque screwdriver should be considered.

¹ SAE = Society of Automotive Engineers

| | |
|----------|----------------------------|
| Item No. | Assembly tool |
| 14100316 | Flexible screwdriver 5/16" |

Recommended assembly torque

| | |
|---------------|-------------------|
| Product Group | Torque (in-lb/Nm) |
| 126 | max. 30/max. 3.4 |
| 177 | max. 35/max. 4.0 |

Minimum ultimate torque

| | |
|---------------|-------------------|
| Product Group | Torque (in-lb/Nm) |
| 126 | min. 60/min. 6.9 |
| 177 | min. 60/min. 6.9 |

Order information

| Item No. | SAE Size No. | Diameter range (in) | Diameter range (mm) | Item No. | SAE Size No. | Diameter range (in) | Diameter range (mm) |
|----------|--------------|---------------------|---------------------|----------|--------------|---------------------|---------------------|
|----------|--------------|---------------------|---------------------|----------|--------------|---------------------|---------------------|

Worm Drive Clamps 126

Band width 1/2 in (12.7 mm), thickness 0.025 in (0.63 mm)

| | | | |
|----------|-----|-----------------|-----------|
| 12600359 | 6 | 3/8 – 7/8 | 9 – 22 |
| 12600374 | 8 | 7/16 – 1 | 11 – 25 |
| 12600375 | 10 | 1/2 – 1 1/16 | 13 – 27 |
| 12600376 | 12 | 9/16 – 1 1/4 | 14 – 32 |
| 12600377 | 16 | 11/16 – 1 1/2 | 17 – 38 |
| 12600378 | 20 | 3/4 – 1 3/4 | 19 – 44 |
| 12600379 | 24 | 1 – 2 | 25 – 51 |
| 12600380 | 28 | 1 1/4 – 2 1/4 | 32 – 57 |
| 12600381 | 32 | 1 1/2 – 2 1/2 | 38 – 63 |
| 12600382 | 36 | 1 13/16 – 2 3/4 | 46 – 70 |
| 12600383 | 40 | 2 – 3 | 52 – 76 |
| 12600384 | 44 | 2 1/4 – 3 1/4 | 57 – 82 |
| 12600385 | 48 | 2 1/2 – 3 1/2 | 65 – 89 |
| 12600386 | 52 | 2 3/4 – 3 3/4 | 70 – 95 |
| 12600387 | 56 | 3 – 4 | 78 – 101 |
| 12600388 | 60 | 3 1/4 – 4 1/4 | 83 – 108 |
| 12600389 | 64 | 2 1/2 – 4 1/2 | 64 – 114 |
| 12600390 | 72 | 3 – 5 | 76 – 127 |
| 12600391 | 80 | 3 1/2 – 5 1/2 | 89 – 140 |
| 12600392 | 88 | 4 – 6 | 102 – 152 |
| 12600393 | 96 | 4 1/2 – 6 1/2 | 114 – 165 |
| 12600394 | 104 | 5 – 7 | 127 – 178 |

Worm Drive Clamps 177

Band width 1/2 in (12.7 mm), thickness 0.025 in (0.63 mm)

| | | | |
|----------|-----|-----------------|-----------|
| 17700338 | 6 | 3/8 – 7/8 | 9 – 22 |
| 17700339 | 8 | 7/16 – 1 | 11 – 25 |
| 17700340 | 10 | 1/2 – 1 1/16 | 13 – 27 |
| 17700341 | 12 | 9/16 – 1 1/4 | 14 – 32 |
| 17700342 | 16 | 11/16 – 1 1/2 | 17 – 38 |
| 17700343 | 20 | 3/4 – 1 3/4 | 19 – 44 |
| 17700344 | 24 | 1 – 2 | 25 – 51 |
| 17700345 | 28 | 1 1/4 – 2 1/4 | 32 – 57 |
| 17700346 | 32 | 1 1/2 – 2 1/2 | 38 – 63 |
| 17700347 | 36 | 1 13/16 – 2 3/4 | 46 – 70 |
| 17700348 | 40 | 2 – 3 | 52 – 76 |
| 17700349 | 44 | 2 1/4 – 3 1/4 | 57 – 82 |
| 17700350 | 48 | 2 1/2 – 3 1/2 | 65 – 89 |
| 17700351 | 52 | 2 3/4 – 3 3/4 | 70 – 95 |
| 17700352 | 56 | 3 – 4 | 78 – 101 |
| 17700353 | 60 | 3 1/4 – 4 1/4 | 83 – 108 |
| 17700354 | 64 | 2 1/2 – 4 1/2 | 64 – 114 |
| 17700355 | 72 | 3 – 5 | 76 – 127 |
| 17700356 | 80 | 3 1/2 – 5 1/2 | 89 – 140 |
| 17700357 | 88 | 4 – 6 | 102 – 152 |
| 17700358 | 96 | 4 1/2 – 6 1/2 | 114 – 165 |
| 17700359 | 104 | 5 – 7 | 127 – 178 |

Multi Crimp Rings

p. 98

MCR AL – Puzzle lock design
Aluminum
150



Full material cross-section over
360°:

+ Constant pressure applied uni-
formly around the circumference

Low assembled height:

+ Minimum space requirement

+ No imbalance on rotating parts

Nominal diameter up to 120 mm:

+ Suitable for universal application,
in particular for thermoplastic
components

Aluminum version:

+ Reduced weight

Oetiker will be pleased to help you to find the correct choice for your application. Send sample parts and all relevant information for your specific application to Oetiker, and you will receive recommendations for product type, diameter, and method of assembly.

p. 98

MCR R – spirally welded
Stainless steel
150



Full material cross-section over
360°:

+ Constant pressure applied uniformly around the circumference

Low assembled height:

+ Minimum space requirement

+ No imbalance on rotating parts

Nominal diameter up to 50 mm:

+ Especially suitable for cooling and heating water circuits, and for airbag systems



Full material cross-section over 360°: constant pressure applied uniformly around the circumference

Flexible diameter reduction: high, adjustable surface pressure, very easy to install

Low assembled height: minimum space requirement, no imbalance on rotating parts

Specially formed strip edges: reduced risk of damage to parts being clamped

Aluminum version*: reduced weight

Multi Crimp Rings MCR 150

MCR with Puzzle lock design

Material

Aluminum, Material EN AW-5754

Corrosion resistance according to DIN EN ISO 9227

150 ≥ 400h

Size range

24.5 – 120.0 mm

Material dimensions

7.0 x 1.5 mm

10.0 x 1.5 mm

Diameter reduction*

Ø 24.5 – Ø 26.5 mm: max. up to Ø 21.9 mm

Ø 27.0 – Ø 40.0 mm: max. 5 mm

Ø 40.5 – Ø 120.0 mm: max. 6 mm

* The diameter reduction is dependent on the nominal diameter of the MCR.

Puzzle design (interlock)

The interlock is a mechanical connection employing very precise mating elements. Its design creates a positive mechanical connection. It ensures secure connection of the ring ends within the permissible load range.

Field of application

The MCR with a puzzle lock is universally applicable due to its large diameter area, but is especially suitable for thermoplastics.

MCR spirally welded

Material

Stainless steel, Material no. 1.4307/UNS S30403

Corrosion resistance according to DIN EN ISO 9227

150 ≥ 800h

Size range

5.0 – 50.0 mm

Material dimensions

On request

Diameter reduction*

Ø 5.0 – Ø 19.0 mm: application-specific

Ø 19.5 – Ø 30.0 mm: max. 20%

Ø 30.5 – Ø 50.0 mm: max. 6 mm

Individual diameters and product variants are only available in appropriate minimum quantities.

* The diameter reduction is dependent on the nominal diameter of the MCR.

Material dimensions

Oetiker Multi Crimp Rings are available in a range of dimensions and materials. The band dimensions should be chosen to take into account the required radial force, the nature of the hose, to ensure the necessary sealing and/or retention properties under the relevant ambient conditions, and any mechanical loads on the MCR.

Diameter reduction

The maximum possible diameter reduction is dependent on the MCR's nominal diameter. The MCR's nominal diameter should be kept as small as possible in relation to the diameter of the parts being clamped in order to shorten shrinking times, simplify positioning, and reduce the material load on the MCR.

Oetiker will be pleased to help you to find the correct choice for your specific application.

A change in the material structure and the band sizes must necessarily take place during assembly. Bear in mind that the smaller the corresponding MCR diameter is, the more drastic these changes will be. The reason for this is the material quantity in relation to the diameter.

The required degree of compression, or the surface pressure exerted on the part being clamped by an MCR depends on the radial force which, in turn, determines the retention and sealing properties.

Each surface pressure must be determined according to the specific application. If the Oetiker shrinking tools specially developed for this purpose are used, an approximately 360° surface pressure of the parts being clamped is achieved without any overlap due to the inner surfaces of the MCR.

Recommendations for installing MCRs

Oetiker Multi Crimp Rings should be closed using the swaging tools developed for them. The Oetiker Swaging Tool ELS 01 offers many advantages for industrial use, for example, opening of the fixture for optimum accessibility and automatic locking, through to the electronic verification of process parameters for force-priority closure. Alternatively, conventional multi segment hydraulic and pneumatic swaging tools are commercially available. For small lots in the diameter range 5.0 – 25.0 mm, Oetiker provides the Cordless Crimp Pincer CC 01.

Field of application

The spirally welded MCR is especially suitable for cooling and heating water circuits as well as for airbag systems.

Tolerance compensation

Tolerance compensation when installing Oetiker Multi Crimp Rings depends entirely on the function sequence of the assembly tool. Fundamentally, with diameter-priority assembly of Oetiker Multi Crimp Rings, tolerance compensation is impossible, because the MCR is simply closed to a specified diameter. This means that the tolerances of components exert their full effect on the degree of compression or the surface pressure applied to the part being clamped. With this type of assembly, everything else is subjugated to achieving a defined diameter.

Thus, tolerance compensating assembly of an MCR can only be achieved with force-priority regulation. Or, to put it a different way, the basic principle here is not pressing to a given diameter, but achieving an empirically determined closing force, and so the surface pressure associated with it.

With the innovative closure concept of the "Oetiker ELS 01", high process reliability combined with the force-priority, verified assembly of Oetiker Multi Crimp Rings is assured. Gauges for checking the closing force are also available.

Order information

For detailed order information, please contact your local Oetiker branch.

Profile Clamps

p. 102

Levi Heavy Duty V-Profile Clamps
280



Lightweight and space efficient

Superior joint integrity

Quick and easy assembly

Engineered to suit customer requirements

Application:

Turbo connections

DP filters

Charge air systems

Exhaust systems

Oetiker will be pleased to help you to find the correct choice for your application. Send sample parts and all relevant information for your specific application to Oetiker, and you will receive recommendations for product type, diameter, and method of assembly.

1-Ear V-Profile Clamp*
(on request)
190



V-Profile:

+ Secure and quickly assembled connections

Clamp ear:

+ Compact, robust fastening

+ Tolerance compensation

Flexible:

+ Customer-specific versions for form and function

Application:

Exhaust systems

Filter units

Suction and compressed air hose

(heat shields)

etc.

* For detailed ordering information please contact your local Oetiker branch.



- Compact design: **lightweight and space efficient**
- High strength: **superior joint integrity**
- Assembly-friendly: **quick and easy assembly**
- 360° positioning: **provides easy access to components in compact environments**
- Engineered solutions: **to suit customer requirements**

Levi Heavy Duty V-Profile Clamps 280

Material

| |
|--|
| W4 Band: 1.4404 |
| Threaded trunnion: 1.4305 |
| Slotted trunnion: 1.4305 |
| Profile segments: 1.4509 |
| ISO 4762 – M8x70 fully threaded: A4-80, Fe/Zn5C1 |

Other materials on request

Corrosion resistance according to ISO 9227

| |
|----------------|
| W4 ≥ 200 hours |
|----------------|

Size range

| |
|---|
| 50.0 – 500.0 mm (Larger sizes on request) |
|---|

Band widths

| |
|---|
| 15.0 mm / 20.0 mm / 25.0 mm / 30.0 mm / 35.0 mm |
|---|

Band thickness

| |
|-----------------------------------|
| 1.0 mm / 1.5 mm / 2.0 mm / 2.5 mm |
|-----------------------------------|

V-profile material thickness

| |
|---|
| 1.0 mm / 1.5 mm |
| For clamp inside diameters 50.0 – 100.0 mm |
| 1.5 mm / 2.0 mm |
| For clamp inside diameters 100.0 – 300.0 mm |
| 2.0 mm / 2.5 mm / 3.0 mm |
| For clamp inside diameters > 300.0 mm |

Recommended installation torque

| |
|-------------|
| M 6 = 7 Nm |
| M 8 = 15 Nm |
| M10 = 25 Nm |
| M12 = 30 Nm |

Recommended tightening speed

| |
|---------------|
| 250 – 350 rpm |
|---------------|

Levi Heavy Duty V-Profile Clamps are used to pull together and connect two circular flanges. They are designed and manufactured from both standard and non-standard components to create a range of final products configured to meet specific application requirements.

The Levi Heavy Duty V-Profile Clamps are very robust and can operate reliably and safely under conditions of stress, vibration, corrosion and temperature variation.

Hardware

Our standard Levi Heavy Duty V-Profile Clamps feature a hexagon socket bolt, threaded up the neck, a threaded trunnion and a quick lock type trunnion for a quick and reliable assembly.

To reduce friction all stainless bolts are coated.

A range of trunnions is also available to suit numerous application requirements such as rotation limitations, prevailing torque etc.

Profiles

We manufacture a number of different segment profiles to suit different applications. The internal profile diameter can be chosen in millimeter increments. It is recommended that the application and any specific requirements be discussed in detail with Oetiker first. In this way, we can ensure that maximum and minimum diameter tooling is available, and that the optimum clamp is selected to ensure fit and provide a secure joint.

Pressed profiles between $\text{Ø} 50.0 - \text{Ø} 150.0$ mm

Rolled profiles from $\text{Ø} 150.0 - \text{Ø} 500.0$ mm

Standard V-profile types

Standard angle 40°



Flange design

Flanges can be machined or formed to meet the specific dimensions for every application. Prior to finalizing your flange design it is recommended that the application and any specific requirements be discussed in detail with us first.

Please contact our engineering department for support.

For a guideline of flange design and dimensions we refer to the DIN standard 3016-3.

Straps



Oetiker will be pleased to help you to find the correct choice for your application. Send sample parts and all relevant information for your specific application to Oetiker, and you will receive recommendations for product type, diameter, and method of assembly.

p. 106

Levi Heavy Duty Straps 283

Ultimate flexibility: many designs
and configurations

Quick and easy assembly

Engineered to suit customer
requirements

Application:

Fuel tanks

Compressed air vessels

Particle filters

EGR coolers

Mufflers

Exhaust systems

Filter casings

Water tanks



Engineered solutions: to suit customer requirements

Ultimate flexibility: many designs and configuration regarding strap end connector styles + material selection + length/thickness + and surface finishing

Assembly-friendly: quick and easy assembly + lightweight

Levi Heavy Duty Straps 283

Band material

Carbon steel

Stainless steel

Surface treatment

Untreated

Zinc coated

Aluzinc

Galvanized

Anti-corrosion primers

Powder coated

Hardware

Loops

Bolts and trunnions

T-Bolts

Quick locks

Weld nuts/bolts

Riveting

Length

30.00 – 3000.00 mm

Band widths

15 – 110 mm

Band thickness

0.7 – 3.0 mm

Fasteners

M6 / M8, M8 / M10, M10 / M12

Engineered tank straps

With the support of our engineering team we are able to supply cost-effective and robust tank strap solutions. We can offer everything from changes in existing products to completely new strap solutions. We manufacture our tank straps in different materials. The straps can be surface treated or coated according to the customer specifications. In addition standard hardware and thermoplastic liners are also available in a large range.

Tank strap assemblies

We are able to offer a large variety of standardized fasteners and rubber/plastic in-liners for the straps. Thanks to large volumes and our lean and cost-effective process we are able to supply you with robust and validated strap assemblies at highly competitive prices.

Variants

The Levi heavy duty straps and clamps can be offered in different variants like flat or pre-formed bands, with C-shaped liners in rubber and thermoplastic materials or pre-assemblies of covers/hardware. We can manufacture different lengths that can fit a cylindrical or customized installation.

Please use our strap design configurator to find our standard range that fits your application.

Assembly Tools

Assembly of Ear Clamps and Low Profile Clamps

p. 110

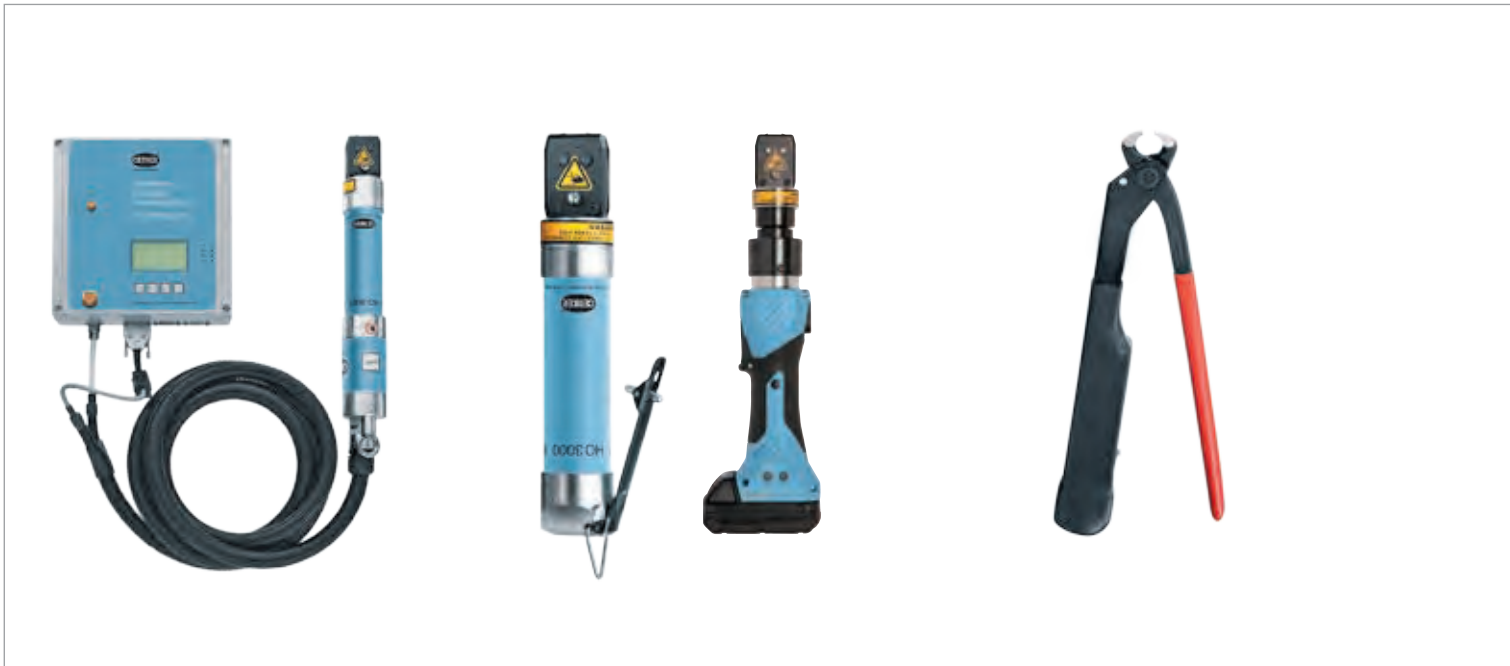
Electronically controlled pneumatic Pincer

p. 126

Pneumatic and Cordless Pincers

p. 130

Hand installation pincers



Reliable process with electronic monitoring of all specified parameters – 100% documentation

High process reliability

Manual closure of clamps

Complete integration into automated systems

Efficient, uniform assembly

Cordless version for flexible use

Communication via PLC* and PC

Optimal usability with the aid of function keys and large display

* PLC = Programmable Logic Controller

Oetiker will be pleased to help you to find the correct choice for your application. Send sample parts and all relevant information for your specific application to Oetiker, and you will receive recommendations for product type, diameter, and method of assembly.

Assembly of Multi Crimp Rings

Calibration of closing forces

p. 132

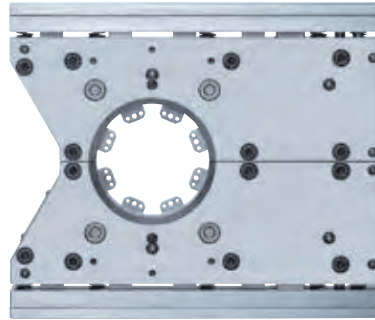
p. 134

p. 140

Cordless Crimp Pincer

Swaging tools

Test Equipment



Efficient, cordless assembly of small Multi Crimp Rings

Lightweight, ergonomic design for easy handling

Assembly of Multi Crimp Rings

Separable or vertical opening for optimum component access

Intermeshing swaging segments guarantee 360° degree compression of MCR

Fast and simple exchange of swaging jaws

Calibration of closing force of assembly tools

Ensures uniform, reproducible process quality



Control Unit



With Type EL – pincer with standard trigger (EL = electronic version)



or with Type ELT – pincer with extended trigger (ELT = electronic version with extended trigger)

Highly efficient, verified assembly

Process reliability, electronic monitoring of parameters – 100% documentation

Multiple closure prevention

Optimal usability thanks to function keys and large display

Force or stroke-priority closure

Complete integration into automated systems (via USB-, extended mixed signal- and RS232 port)

Electronically Controlled Pneumatic Pincer Oetiker ELK 02

This high quality, complete pincer system ensures the uniform and reliable assembly of Oetiker clamps and consists of the control unit and the pincer.

For optimal adaption to any requirement a wide range of pincer body sizes and pincer heads is available. The control unit can be selected with plug types for different regions.

Oetiker will be pleased to help you to find the correct choice for your application.

Data log acquisition from an Oetiker ELK 02 is available in the integrated “Measurement”-mask, when connected to a PC.

Standard hose/cable length of the Trigger unit is 3 m. Alternative hose/cable lengths, also as angled versions, on request.

The ELK 02 control unit and the software can be operated in different languages. The technical description is included on a CD.

Selection example

For a closing force of approx. 3000 N and using an HO 3000 EL, the available inlet pressure must be at least 6 bar. The closing force itself must be set to the required data by changing parameters in the ELK 02 control unit. This can be done using a PC. The closure can be triggered off manually or by programming a sequence into the ELK02 or by an external control signal. A closing force tester, for example Test Equipment CAL 01, is used to determine and set the correct closing force.

To maintain consistent pincer force, sufficient compressed air pressure and volume must be provided.

Technical data ELK 02 control unit

| | |
|------------------------|---------------------|
| Power supply: | 85–265 V / 47–63 Hz |
| Power requirement: | 30 Va (Fuse 10 A) |
| Compressed air supply: | 4–10 bar |
| External dimensions: | 200 x 230 x 70 mm |
| Weight: | 3.7 kg |

Delivery scope ELK 02 control unit

| |
|--|
| Control unit item no. 13600289 |
| PC Software ELK 02 |
| CD with operating instructions |
| Compressed air connection set (incl. filter/water separator) |
| Connection cable for all interfaces |
| Main cable with country-specific plug |

Selection of control unit

| | | | | | | | |
|-----------------|---|--------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|-----------------------------------|
| Plug type | Schuko plug (plug type F, 3-pole) | CH (plug type J, 3-pole) | UK (plug type G, 3-pole) | USA (plug type B, 3-pole) | South America (plug 3-pole) | AUS (plug type I, 3-pole) | Japan (plug type B, 3-pole) |
| Norm conformity | CEE 7/4 | SEV 1011 | BS 1363 | NEMA 5-15 | NBR 14136 | AS 3112 | NEMA 5-15 |
| Item No. | 13600348 | 13600349 | 13600350 | 13600351 | 13600352 | 13600353 | 13600354 |

For control unit ELK 02, order pincer and pincer head in accordance with the requirements of the Oetiker clamp type to be assembled: see following pages.

Selection of complete pincer systems

The complete pincer system consists of pincer head and pincer.

- 1) First select the pincer head in accordance with the requirement.
- 2) Then select the pincer type (EL or ELT) in the corresponding columns below. The item numbers for the complete pincer include the pincer and the desired pincer head.

Pincer heads

| | | | | | | | | | |
|---------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Jaw width (mm) | 5.5 | 7.5 | 7.5 | 10.2 | 10.2 | 10.5 | 10.5 | 14.5 | 14.5 |
| Open gap (mm) | 8.6 | 11.6 | 13.2 | 13.2 | 16.2 | 13.7 | 16.6 | 16.6 | 16.6 |
| For ear width* (mm) | </= 7 | 8 | 10 | 10 | 13 | 10 | 13 | 13 | 13 |
| Item No. | 13900156 | 13900152 | 13900148 | 13900119 | 13900140 | 13900112 | 13900097 | 13900544 | 13900774 |

* measured inside

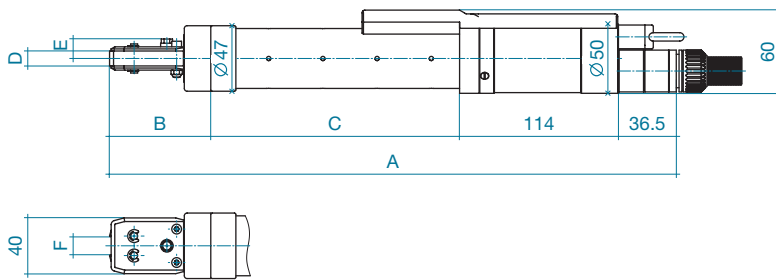
| Type HO X000 EL – Pincer with standard trigger | | | | | | | | | | EL without pincer head |
|--|----------|----------|-----------------|-----------------|----------|-----------------|----------|----------|---|------------------------|
| HO 2000 EL | | | | | | | | | | |
| Pincer complete | 13900187 | 13900188 | 13900189 | 13900191 | - | - | - | - | - | 13900231 |
| Replacement-jaw kit | 13900166 | 13900167 | 13900168 | 13900163 | - | - | - | - | - | |
| HO 3000 EL | | | | | | | | | | |
| Pincer complete | - | 13900192 | 13900193 | 13900195 | 13900196 | - | - | - | - | 13900232 |
| Replacement-jaw kit | - | 13900167 | 13900168 | 13900163 | 13900170 | - | - | - | - | |
| HO 4000 EL | | | | | | | | | | |
| Pincer complete | - | - | - | 13900199 | 13900200 | - | - | - | - | 13900233 |
| Replacement-jaw kit | - | - | - | 13900163 | 13900170 | - | - | - | - | |
| HO 5000 EL | | | | | | | | | | |
| Pincer complete | - | - | - | - | - | 13900201 | 13900202 | - | - | 13900234 |
| Replacement-jaw kit | - | - | - | - | - | 13900164 | 13900165 | - | - | |
| HO 7000 EL | | | | | | | | | | |
| Pincer complete | - | - | - | - | - | 13900203 | 13900204 | 13900547 | - | 13900235 |
| Replacement-jaw kit | - | - | - | - | - | 13900164 | 13900165 | 13900545 | - | |

| Type HO X000 ELT – Pincer with extended trigger | | | | | | | | | | ELT without pincer head |
|---|----------|----------|-----------------|-----------------|----------|-----------------|----------|----------|---|-------------------------|
| HO 2000 ELT | | | | | | | | | | |
| Pincer complete | 13900529 | 13900530 | 13900496 | 13900532 | - | - | - | - | - | 13900333 |
| Replacement-jaw kit | 13900166 | 13900167 | 13900168 | 13900163 | - | - | - | - | - | |
| HO 3000 ELT | | | | | | | | | | |
| Pincer complete | - | 13900533 | 13900534 | 13900373 | 13900536 | - | - | - | - | 13900335 |
| Replacement-jaw kit | - | 13900167 | 13900168 | 13900163 | 13900170 | - | - | - | - | |
| HO 4000 ELT | | | | | | | | | | |
| Pincer complete | - | - | - | 13900539 | 13900540 | - | - | - | - | 13900337 |
| Replacement-jaw kit | - | - | - | 13900163 | 13900170 | - | - | - | - | |
| HO 5000 ELT | | | | | | | | | | |
| Pincer complete | - | - | - | - | - | 13900525 | 13900526 | - | - | 13900339 |
| Replacement-jaw kit | - | - | - | - | - | 13900164 | 13900165 | - | - | |
| HO 7000 ELT | | | | | | | | | | |
| Pincer complete | - | - | - | - | - | 13900382 | 13900541 | 13900723 | - | 13900341 |
| Replacement-jaw kit | - | - | - | - | - | 13900164 | 13900165 | 13900545 | - | |
| HO 10000 ELT | | | | | | | | | | |
| Pincer complete | - | - | - | - | - | - | - | - | - | 13900805 13900879 |
| Replacement-jaw kit | - | - | - | - | - | - | - | - | - | 13900545 |

Item numbers in **bold type** belong to the recommended basic equipment. Replacement jaw kit = left and right pincer jaws complete with all necessary parts. The jaw width must be at least 0.5 mm wider than the band used for the clamps to be assembled. The opening gap should be wide enough for the largest ear.

Technical data

HO 2000 EL/ELT, HO 3000 EL/ELT, HO 4000 EL/ELT



Pincer heads

| | | | | | | |
|---------------------|----------|----------|----------|----------|----------|----------|
| Jaw width (mm) | 5.5 | 7.5 | 7.5 | 10.2 | 10.2 | 10.2 |
| For ear width* (mm) | <= 7 | 8 | 10 | 8 | 10 | 13 |
| Item No. | 13900156 | 13900152 | 13900148 | 13900144 | 13900119 | 13900140 |

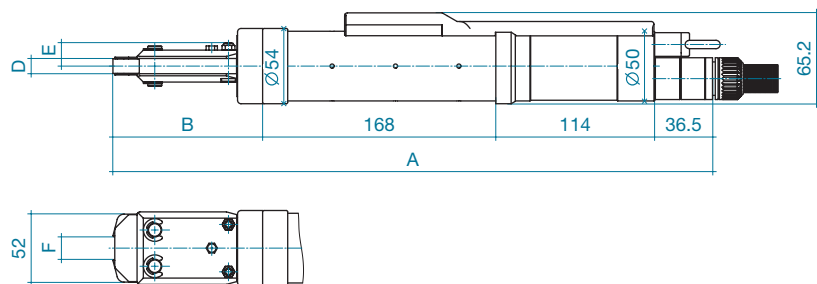
Type of pincer

| | | | | | | | |
|----------------|--------|-------|-------|-------|-------|-------|-------|
| HO 2000 EL/ELT | A (mm) | 325.0 | 324.0 | 324.0 | 324.0 | 324.0 | - |
| | B (mm) | 74.0 | 73.0 | 73.0 | 73.0 | 73.0 | - |
| | C (mm) | 101.0 | 101.0 | 101.0 | 101.0 | 101.0 | - |
| | D (mm) | 5.5 | 7.5 | 7.5 | 10.2 | 10.2 | - |
| | E (mm) | 12.3 | 13.3 | 13.3 | 14.9 | 14.9 | - |
| | F (mm) | 8.6 | 11.6 | 13.2 | 11.6 | 13.2 | - |
| HO 3000 EL/ELT | A (mm) | - | 363.0 | 363.0 | 363.0 | 363.0 | 368.0 |
| | B (mm) | - | 73.0 | 73.0 | 73.0 | 73.0 | 78.0 |
| | C (mm) | - | 140.0 | 140.0 | 140.0 | 140.0 | 140.0 |
| | D (mm) | - | 7.5 | 7.5 | 10.2 | 10.2 | 10.2 |
| | E (mm) | - | 13.3 | 13.3 | 14.9 | 14.9 | 14.9 |
| | F (mm) | - | 11.6 | 13.2 | 11.6 | 13.2 | 16.2 |
| HO 4000 EL/ELT | A (mm) | - | - | 402.0 | 402.0 | 402.0 | 407.0 |
| | B (mm) | - | - | 73.0 | 73.0 | 73.0 | 78.0 |
| | C (mm) | - | - | 179.0 | 179.0 | 179.0 | 179.0 |
| | D (mm) | - | - | 7.5 | 10.2 | 10.2 | 10.2 |
| | E (mm) | - | - | 13.3 | 14.9 | 14.9 | 14.9 |
| | F (mm) | - | - | 13.2 | 11.6 | 13.2 | 16.2 |

* measured inside

Technical data

HO 5000 EL/ELT



Pincer heads

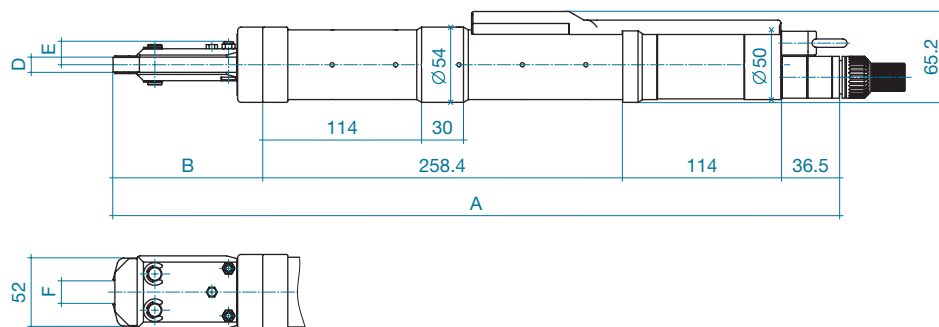
| | | | |
|---------------------|----------|----------|----------|
| Jaw width D (mm) | 10.5 | 10.5 | 14.5 |
| For ear width* (mm) | 10 | 13 | 13 |
| Item No. | 13900112 | 13900097 | 13900544 |

* measured inside

Type of pincer

| | | | | |
|----------------|--------|-------|-------|-------|
| HO 5000 EL/ELT | A (mm) | 420.5 | 425.5 | 425.5 |
| | B (mm) | 102.0 | 107.0 | 107.0 |
| | E (mm) | 16.6 | 16.6 | 18.6 |
| | F (mm) | 13.7 | 16.6 | 16.6 |

HO 7000 EL/ELT



Pincer heads

| | | | |
|---------------------|----------|----------|----------|
| Jaw width D (mm) | 10.5 | 10.5 | 14.5 |
| For ear width* (mm) | 10 | 13 | 13 |
| Item No. | 13900112 | 13900097 | 13900544 |

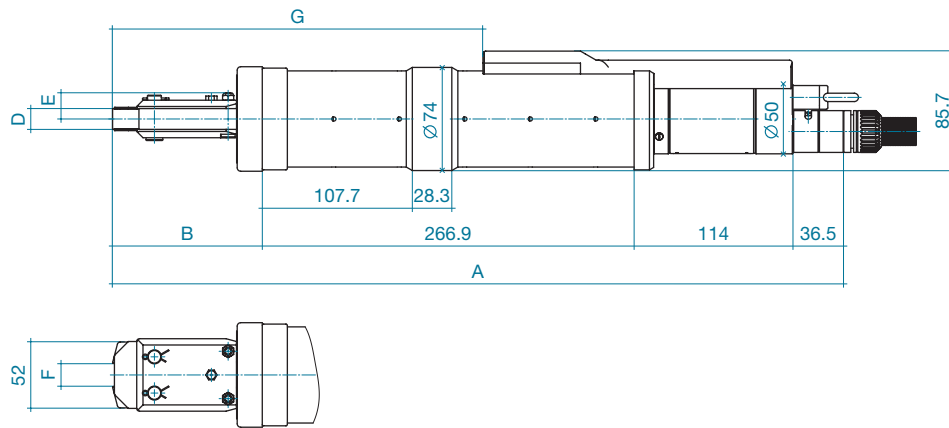
* measured inside

Type of pincer

| | | | | |
|----------------|--------|-------|-------|-------|
| HO 7000 EL/ELT | A (mm) | 511.0 | 516.0 | 516.0 |
| | B (mm) | 102.0 | 107.0 | 107.0 |
| | E (mm) | 16.6 | 16.6 | 18.6 |
| | F (mm) | 13.7 | 16.6 | 16.6 |

Technical data

HO 10000 ELT



Pincer heads

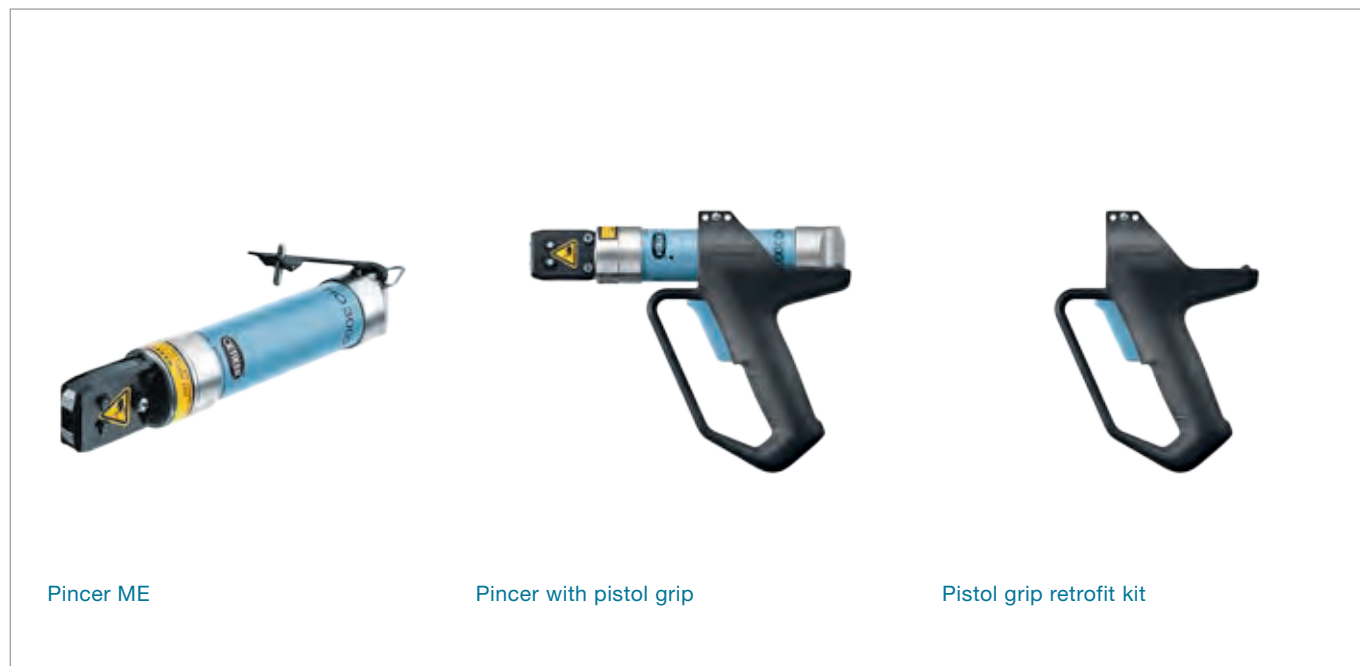
| | |
|---------------------|----------|
| Jaw width D (mm) | 14.5 |
| For ear width* (mm) | 13 |
| Item No. | 13900774 |

* measured inside

Type of pincer

| | | |
|--------------|--------|-------|
| HO 10000 ELT | A (mm) | 525.0 |
| | B (mm) | 107.4 |
| | E (mm) | 18.6 |
| | F (mm) | 16.6 |

Compressed air connection: internal thread G 1/4



Pincer ME

Highly process reliable and efficient assembly

Full range of pincer heads, for compatibility to all standard clamps

Adaptation of different pincer head designs according to application

Option: Pistol grip (for HO 2000–4000 ME)

Lightweight and ergonomic design for one-handed operation

Pneumatic Pincers Oetiker ME

This high-quality, complete pincer system ensures the uniform assembly of Oetiker clamps. The selection of the correct pincer body and head is determined by the type of Oetiker clamp to be assembled, the optimum closing force and the air supply pressure that is available.

To obtain the optimum closing force, please refer to the technical information for the product being assembled and take into account the availability of special pincer heads.

Selection example

For a closing force of approx. 3000 N and using an HO 3000 ME, the available inlet pressure must be at least 6 bar. The closing force must be set to the data given. To change the closing force, the inlet pressure must be adjusted. A closing force tester, for example Test Equipment CAL 01, is used to determine and set the correct closing force.

For ergonomic operation we provide a pistol grip for HO 2000/3000/4000 ME. It is a lightweight accessory that can be assembled easily by our Powertool Service Center. The pistol grip is available as a retrofit kit or in combination with a new pincer.

To maintain consistent pincer force, sufficient compressed air pressure and volume must be provided.

- [Delivery scope pneumatic pincer Oetiker ME](#)
- [Oetiker ME with pincer head](#)
- [Compressed air connection set \(incl. filter/water separator\)](#)
- [Operating instruction](#)

Selection of complete pincer systems

The complete pincer system consists of pincer head and pincer.

- 1) First select the pincer head in accordance with the requirement.
- 2) Then select the pincer type in the corresponding columns below. The item number for the complete pincer and complete pincer with pistol grip include the selected pincer head.

Pincer heads

| | | | | | | | | |
|---------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Jaw width (mm) | 5.5 | 7.5 | 7.5 | 10.2 | 10.2 | 10.5 | 10.5 | 14.5 |
| Open gap (mm) | 8.6 | 11.6 | 13.2 | 13.2 | 16.2 | 13.7 | 16.6 | 16.6 |
| For ear width* (mm) | </= 7 | 8 | 10 | 10 | 13 | 10 | 13 | 13 |
| Item No. | 13900158 | 13900154 | 13900150 | 13900138 | 13900142 | 13900113 | 13900114 | 13900543 |

| Type of pincer | | | | | | | | | ME without pincer head |
|----------------------------------|----------|----------|-----------------|-----------------|----------|-----------------|----------|----------|-------------------------------|
| HO 2000 ME | | | | | | | | | |
| Pincer complete | 13900173 | 13900174 | 13900176 | 13900182 | - | - | - | - | 13900226 |
| Pincer complete with pistol grip | 13900930 | 13900931 | 13900932 | 13900934 | - | - | - | - | 13901301 |
| Replacement-jaw kit | 13900166 | 13900167 | 13900168 | 13900163 | - | - | - | - | - |
| HO 3000 ME | | | | | | | | | |
| Pincer complete | - | 13900175 | 13900177 | 13900183 | 13900185 | - | - | - | 13900227 |
| Pincer complete with pistol grip | - | 13900935 | 13900936 | 13900938 | 13900939 | - | - | - | 13901302 |
| Replacement-jaw kit | - | 13900167 | 13900168 | 13900163 | 13900170 | - | - | - | - |
| HO 4000 ME | | | | | | | | | |
| Pincer complete | - | - | - | 13900184 | 13900186 | - | - | - | 13900228 |
| Pincer complete with pistol grip | - | - | - | 13900940 | 13900941 | - | - | - | 13901303 |
| Replacement-jaw kit | - | - | - | 13900163 | 13900170 | - | - | - | - |
| HO 5000 ME | | | | | | | | | |
| Pincer complete | - | - | - | - | - | 13900161 | 13900162 | - | 13900229 |
| Replacement-jaw kit | - | - | - | - | - | 13900164 | 13900165 | - | - |
| HO 7000 ME | | | | | | | | | |
| Pincer complete | - | - | - | - | - | 13900171 | 13900172 | 13900546 | 13900230 |
| Replacement-jaw kit | - | - | - | - | - | 13900164 | 13900165 | 13900545 | - |
| | | | | | | | | | Individual order number |
| Pistol grip retrofit kit | - | - | - | - | - | - | - | - | 13901300 |

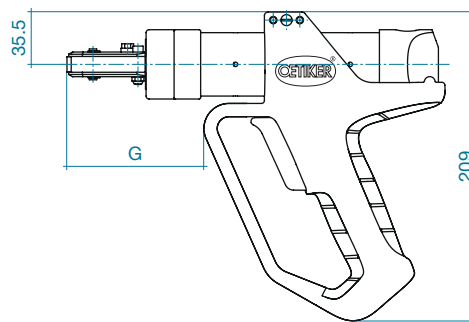
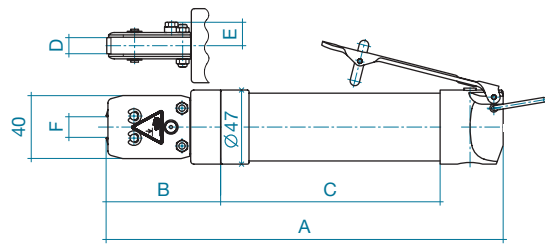
* measured inside

Item numbers in **bold type** belong to the recommendend basic equipment. Replacement jaw kit = left and right pincer jaws complete with all necessary parts. The jaw width must be at least 0.5 mm wider than the band used for the clamps to be assembled. The opening gap should be wide enough for the largest ear.

Technical data

HO 2000 ME, HO 3000 ME, HO 4000 ME

Pincer complete with pistol grip



Pincer heads

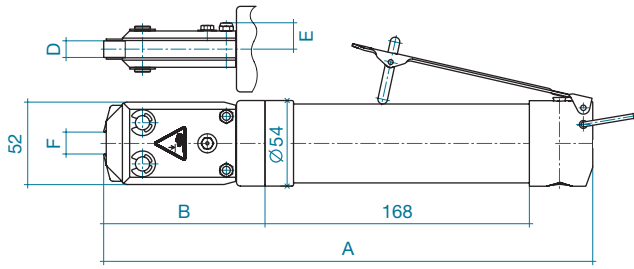
| | | | | | |
|---------------------|---------------------|----------|----------|----------|----------|
| Jaw width D (mm) | 5.5 | 7.5 | 7.5 | 10.2 | 10.2 |
| For ear width* (mm) | ≤ 7 | 8 | 10 | 10 | 13 |
| Item No. | 13900158 | 13900154 | 13900150 | 13900138 | 13900142 |

Type of pincer

| | | | | | | |
|----------------------------|--------|-------|-------|-------|-------|-------|
| HO 2000 ME | A (mm) | 214.0 | 213.0 | 213.0 | 213.0 | - |
| | B (mm) | 74.0 | 73.0 | 73.0 | 73.0 | - |
| | C (mm) | 101.0 | 101.0 | 101.0 | 101.0 | - |
| | D (mm) | 5.5 | 7.5 | 7.5 | 10.2 | - |
| | E (mm) | 12.3 | 13.3 | 13.3 | 14.9 | - |
| | F (mm) | 8.6 | 11.6 | 13.2 | 13.2 | - |
| Pistol Grip for HO 2000 ME | G (mm) | 55.0 | 54.0 | 54.0 | 54.0 | - |
| HO 3000 ME | A (mm) | - | 252.0 | 252.0 | 252.0 | 257.0 |
| | B (mm) | - | 73.0 | 73.0 | 73.0 | 78.0 |
| | C (mm) | - | 140.0 | 140.0 | 140.0 | 140.0 |
| | D (mm) | - | 7.5 | 7.5 | 10.2 | 10.2 |
| | E (mm) | - | 13.3 | 13.3 | 14.9 | 14.9 |
| | F (mm) | - | 11.6 | 13.2 | 13.2 | 16.2 |
| Pistol Grip for HO 3000 ME | G (mm) | - | 93.0 | 93.0 | 93.0 | 98.0 |
| HO 4000 ME | A (mm) | - | - | 291.0 | 291.0 | 296.0 |
| | B (mm) | - | - | 73.0 | 73.0 | 78.0 |
| | C (mm) | - | - | 179.0 | 179.0 | 179.0 |
| | D (mm) | - | - | 7.5 | 10.2 | 10.2 |
| | E (mm) | - | - | 13.3 | 14.9 | 14.9 |
| | F (mm) | - | - | 13.2 | 13.2 | 16.2 |
| Pistol Grip for HO 4000 ME | G (mm) | - | - | - | 132.0 | 137.0 |

* measured inside

HO 5000 ME



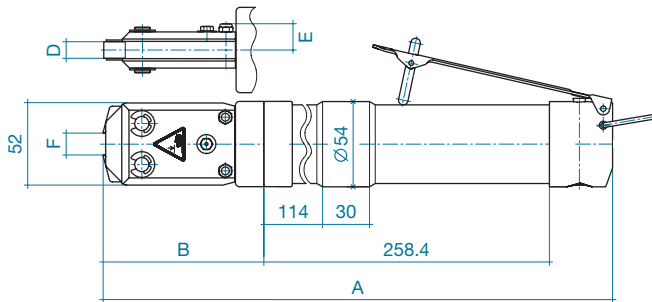
Pincer heads

| | | | |
|---------------------|----------|----------|----------|
| Jaw width D (mm) | 10.5 | 10.5 | 14.5 |
| For ear width* (mm) | 10 | 13 | 13 |
| Item No. | 13900113 | 13900114 | 13900543 |

Type of pincer

| | | | |
|-------------------|-------|-------|-------|
| HO 5000 ME A (mm) | 309.0 | 314.0 | 314.0 |
| B (mm) | 102.0 | 107.0 | 107.0 |
| E (mm) | 16.6 | 16.6 | 18.6 |
| F (mm) | 13.7 | 16.6 | 16.6 |

HO 7000 ME



Pincer heads

| | | | |
|---------------------|----------|----------|----------|
| Jaw width D (mm) | 10.5 | 10.5 | 14.5 |
| For ear width* (mm) | 10 | 13 | 13 |
| Item No. | 13900113 | 13900114 | 13900543 |

Type of pincer

| | | | |
|-------------------|-------|-------|-------|
| HO 7000 ME A (mm) | 400.0 | 405.0 | 405.0 |
| B (mm) | 102.0 | 107.0 | 107.0 |
| E (mm) | 16.6 | 16.6 | 18.6 |
| F (mm) | 13.7 | 16.6 | 16.6 |

* measured inside

Compressed air connection: internal thread G 1/4

Special Pincer Heads for Oetiker ME/EL

– Assembly of Oetiker Ear Clamps ^{1/2}

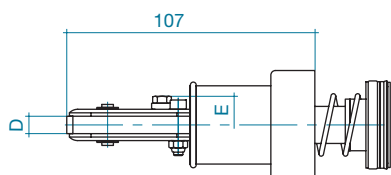
Pincer head with extended holders

Different extensions allow to reach areas where access is restricted.
Compatible with pincer types HO 2000 to HO 4000.

Selection of pincer heads

The jaw width must be at least 0.5 mm wider than the band used for the clamps to be assembled. The opening gap should be wide enough for the largest ear.

Extension 34.5 mm



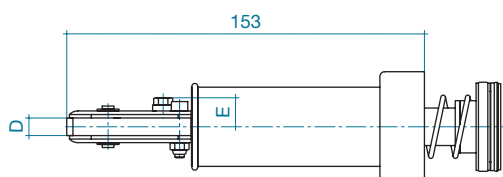
Pincer heads

| | | | |
|----------------------|---------------------|------|------|
| Jaw width D (mm) | 5.5 | 7.5 | 10.2 |
| Open gap (mm) | 8.6 | 13.2 | 13.2 |
| Height E (mm) | 11.0 | 12.0 | 14.0 |
| For ear width** (mm) | ≤ 7 | 10 | 10 |

Type of pincer

| | | | |
|-----------------------------|----------|----------|----------|
| HO ME Pincer head complete | 13900272 | 13900274 | 13900276 |
| Replacement-jaw kit | 13900166 | 13900168 | 13900163 |
| HO EL* Pincer head complete | 13900271 | 13900273 | 13900275 |
| Replacement-jaw kit | 13900166 | 13900168 | 13900163 |
| Check gauge*** | 13600016 | 13600016 | 13600016 |

Extension 80 mm



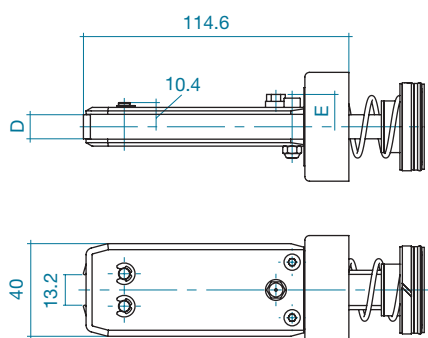
Pincer heads

| | | | |
|----------------------|---------------------|------|------|
| Jaw width D (mm) | 5.5 | 7.5 | 10.2 |
| Open gap (mm) | 8.6 | 13.2 | 13.2 |
| Height E (mm) | 11.0 | 12.0 | 14.0 |
| For ear width** (mm) | ≤ 7 | 10 | 10 |

Type of pincer

| | | | |
|-----------------------------|----------|----------|----------|
| HO ME Pincer head complete | 13900278 | 13900280 | 13900282 |
| Replacement-jaw kit | 13900166 | 13900168 | 13900163 |
| HO EL* Pincer head complete | 13900277 | 13900279 | 13900281 |
| Replacement-jaw kit | 13900166 | 13900168 | 13900163 |
| Check gauge*** | 13600016 | 13600016 | 13600016 |

Extension 42 mm, narrow



Pincer heads

| | | |
|----------------------|------|------|
| Jaw width (mm) | 7.5 | 10.2 |
| Open gap (mm) | 13.2 | 13.2 |
| Height E (mm) | 12.7 | 14.0 |
| For ear width** (mm) | 10 | 10 |

Type of pincer

| | | |
|-----------------------------|----------|----------|
| HO ME Pincer head complete | 13900821 | 13900801 |
| Replacement-jaw kit | 13900168 | 13900163 |
| HO EL* Pincer head complete | 13900820 | 13900802 |
| Replacement-jaw kit | 13900168 | 13900163 |

* also for ELT type

** Measured inside

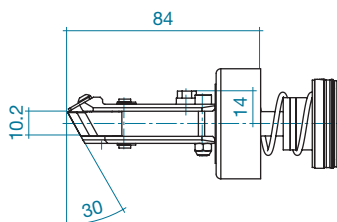
*** already included in CAL 01

Pincer heads with angled jaws

Specially for installing ear clamps where access is restricted.

Suitable for ear clamps with 7 and 9 mm band widths. Compatible with pincer types HO 2000 to HO 4000.

Jaws angled at 30°



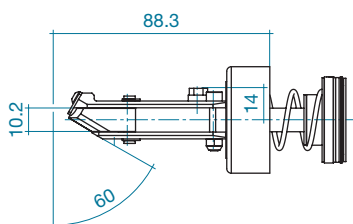
Pincer heads 30°

| | |
|----------------------|------|
| Jaw width (mm) | 10.2 |
| Open gap (mm) | 13.2 |
| For ear width** (mm) | 10 |

Type of pincer

| | | |
|--------|----------------------|----------|
| HO ME | Pincer head complete | 13900706 |
| HO EL* | Pincer head complete | 13900707 |
| | Replacement-jaw kit | 13900708 |
| | Calibration set | 13900871 |

Jaws angled at 60°



Pincer heads 60°

| | |
|----------------------|------|
| Jaw width (mm) | 10.2 |
| Open gap (mm) | 13.2 |
| For ear width** (mm) | 10 |

Type of pincer

| | | |
|--------|----------------------|----------|
| HO ME | Pincer head complete | 13900694 |
| HO EL* | Pincer head complete | 13900697 |
| | Replacement-jaw kit | 13900695 |
| | Calibration set | 13900872 |

* also for ELT

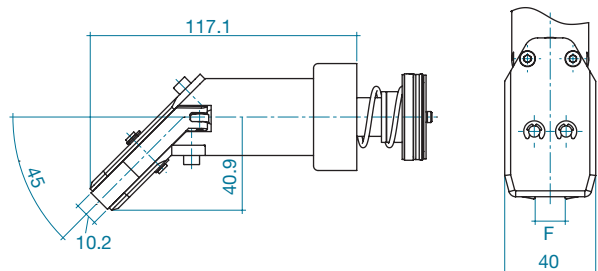
** Measured inside

Special Pincer Heads for Oetiker ME/EL

– Assembly of Oetiker Ear Clamps ^{2/2}

Jaws angled at 45°

Compatible with pincer types HO 2000 to 4000.



Pincer heads 45°

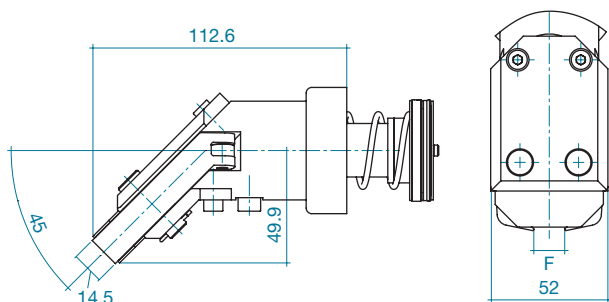
| | | |
|----------------------|------|------|
| Jaw width (mm) | 10.2 | 10.2 |
| Open gap F (mm) | 13.2 | 16.2 |
| For ear width** (mm) | 10 | 13 |

Type of pincer

| | | | |
|--------|----------------------|----------|----------|
| HO ME | Pincer head complete | 13901271 | 13900775 |
| | Replacement-jaw kit | 13900777 | 13900777 |
| HO EL* | Pincer head complete | | 13900776 |
| | Replacement-jaw kit | | 13900777 |

Jaws angled at 45°

Compatible with pincer types HO 5000 and 7000.



Pincer heads 45°

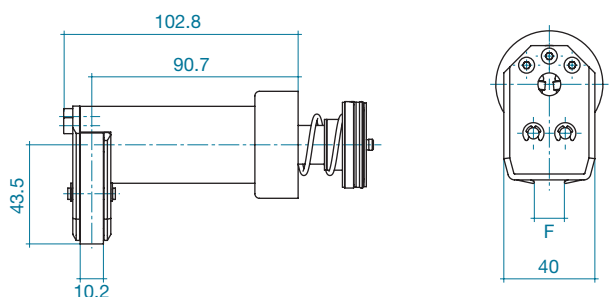
| | | |
|----------------------|------|------|
| Jaw width (mm) | 14.5 | 14.5 |
| Open gap F (mm) | 13.7 | 16.6 |
| For ear width** (mm) | 10 | 13 |

Type of pincer

| | | | |
|--------|----------------------|----------|----------|
| HO ME | Pincer head complete | 13900784 | 13900782 |
| | Replacement-jaw kit | 13900785 | 13900785 |
| HO EL* | Pincer head complete | | 13900783 |
| | Replacement-jaw kit | | 13900785 |

Jaws angled at 90°

Compatible with pincer types HO 2000 to 4000.



Pincer heads 90°

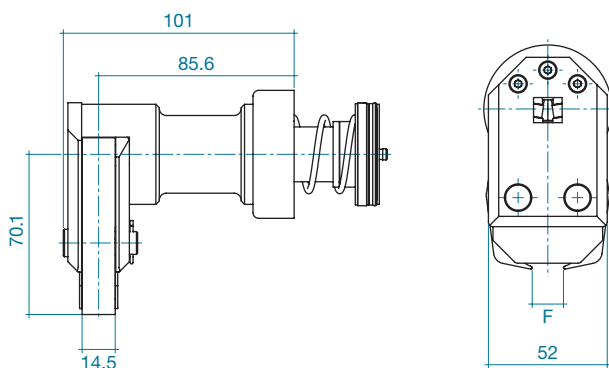
| | | |
|----------------------|------|------|
| Jaw width (mm) | 10.2 | 10.2 |
| Open gap F (mm) | 13.2 | 16.2 |
| For ear width** (mm) | 10 | 13 |

Type of pincer

| | | | |
|--------|----------------------|----------|----------|
| HO ME | Pincer head complete | 13900781 | 13900778 |
| | Replacement-jaw kit | 13900780 | 13900780 |
| HO EL* | Pincer head complete | | 13900779 |
| | Replacement-jaw kit | | 13900780 |

Jaws angled at 90°

Compatible with pincer types HO 5000 and 7000.



Pincer heads 90°

| | | |
|----------------------|------|------|
| Jaw width (mm) | 14.5 | 14.5 |
| Open gap F (mm) | 13.7 | 16.6 |
| For ear width** (mm) | 10 | 13 |

Type of pincer

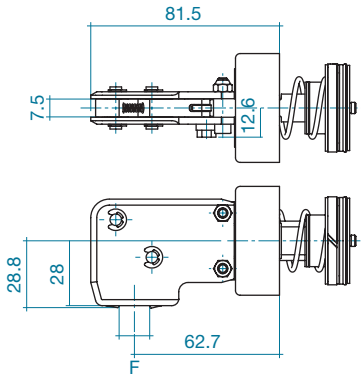
| | | | |
|--------|----------------------|----------|----------|
| HO ME | Pincer head complete | 13900788 | 13900786 |
| | Replacement-jaw kit | 13900789 | 13900789 |
| HO EL* | Pincer head complete | | 13900787 |
| | Replacement-jaw kit | | 13900789 |

* also for ELT

** Measured inside

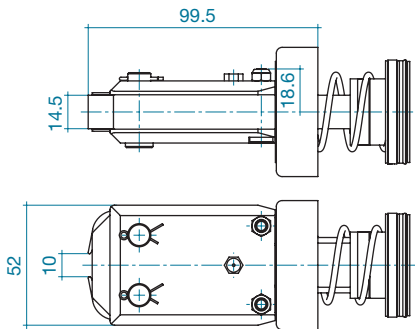
90° lengthwise

Compatible with pincer types HO 2000 to 4000.



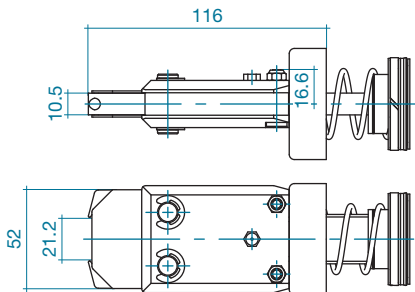
Pincer Head for 1-Ear Clamp with stud

Pincer head for assembly of 1-Ear Clamp with stud, band width 14 mm. Compatible with pincer types HO 5000 and 7000.



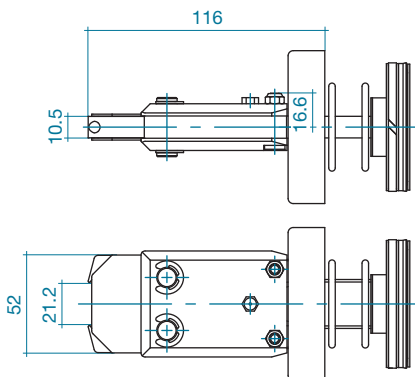
Pincer Head for ToothLock® Ear Clamp

Pincer head for assembly of ToothLock® Ear Clamp. Compatible with pincer type HO 7000.



Pincer Head for ToothLock® Ear Clamp

Pincer head for assembly of ToothLock® Ear Clamp. Compatible with pincer type HO 10000.



Pincer heads 90° lengthwise

| | | |
|----------------------|------|------|
| Jaw width (mm) | 7.5 | 7.5 |
| Open gap F (mm) | 13.2 | 16.2 |
| For ear width** (mm) | 10 | 13 |

Type of pincer

| | | | |
|--------|----------------------|----------|----------|
| HO ME | Pincer head complete | 13901280 | 13901282 |
| HO EL* | Pincer head complete | 13901281 | 13901283 |
| | Replacement-jaw kit | 13901284 | 13901284 |

Pincer heads

| | |
|----------------------|-------|
| Jaw width (mm) | 14.5 |
| Open gap (mm) | 10.0 |
| For ear width** (mm) | ≤ 5.5 |

Type of pincer

| | | |
|--------|----------------------|----------|
| HO ME | Pincer head complete | 13900773 |
| HO EL* | Pincer head complete | 13900772 |
| | Replacement-jaw kit | 13900771 |
| | Calibration set | 13600058 |

Pincer heads

| | |
|----------------------|------|
| Jaw width (mm) | 10.5 |
| Open gap (mm) | 21.2 |
| For ear width** (mm) | 17 |

Type of pincer

| | | |
|--------|----------------------|----------|
| HO ME | Pincer head complete | 13900851 |
| HO EL* | Pincer head complete | 13900852 |
| | Replacement-jaw kit | 13900853 |

Pincer heads

| | |
|----------------------|------|
| Jaw width (mm) | 10.5 |
| Open gap (mm) | 21.2 |
| For ear width** (mm) | 17 |

Type of pincer

| | | |
|--------|----------------------|----------|
| HO EL* | Pincer head complete | 13900854 |
| | Replacement-jaw kit | 13900853 |

* also for ELT

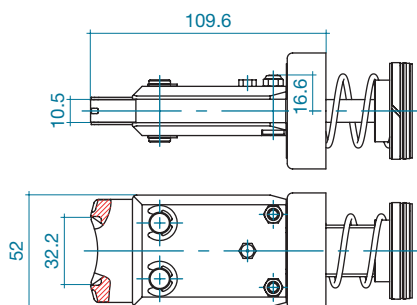
** Measured inside

Special Pincer Heads for Oetiker ME/EL – Assembly of Oetiker StepLess® Low Profile Clamps

All Oetiker StepLess® Low Profile Clamps have unique head requirements and are specific to the product group designation and type.

When using Oetiker ME pneumatic pincers, it is essential to use a throttle valve for adjusting the closing speed.

Pincer head for installing ToothLock® Low Profile Clamp – 292
Compatible with pincer type HO 5000 and HO 7000.

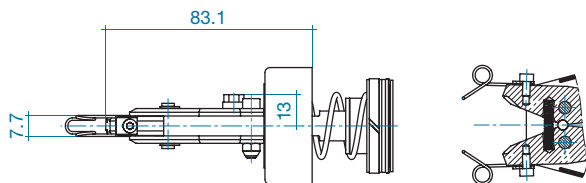


| | |
|----------------|------|
| Pincer heads | |
| Jaw width (mm) | 10.5 |

| | | |
|----------------|----------------------|----------|
| Type of Pincer | | |
| HO EL* | Pincer head complete | 13900847 |
| | Replacement-jaw kit | 13900848 |
| | Calibration set | 13900942 |

Pincer heads for installing reusable StepLess® Low Profile Clamps – 168 (RWV)

The hold-down springs fitted to both jaws make closure easier and improve handling. Compatible with pincer types HO 2000 to 4000.

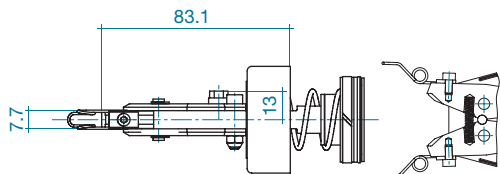


| | |
|----------------|-----|
| Pincer heads | |
| Jaw width (mm) | 7.7 |

| | | |
|--------------|---------------------------------------|----------|
| Pincer types | | |
| HO ME | Pincer head complete | 13900668 |
| | Replacement-jaw kit | 13900673 |
| | Spring accessory | 13900677 |
| | Calibration adaptor | 13900862 |
| | Throttle valve | 13900636 |
| | Throttle valve with adaptor for NPT 1 | 13900637 |
| HO EL* | Pincer head complete | 13900667 |
| | Replacement-jaw kit | 13900673 |
| | Spring accessory | 13900677 |
| | Calibration adaptor | 13900862 |

Pincer heads for installing StepLess® Low Profile Clamps – 168

The optional hold-down springs improve handling, especially for production-line applications. Can be used for standard clamps from 50 mm (or approx. 19.5 mm for special types). Can be used for clamps 7, 9 mm and 10 mm wide. Compatible with pincer types HO 3000 and 4000.



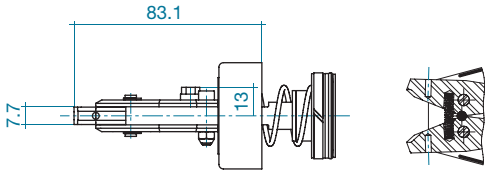
| | | | |
|----------------|--|----------|-----------|
| Pincer heads | | Standard | Special** |
| Jaw width (mm) | | 7.7 | 7.7 |

| | | | |
|--------------|---------------------------------------|----------|----------|
| Pincer types | | | |
| HO ME | Pincer head complete | 13900664 | 13900666 |
| | Replacement-jaw kit | 13900673 | 13900673 |
| | Spring accessory | 13900675 | 13900676 |
| | Calibration adaptor | 13900862 | 13900862 |
| | Throttle valve | 13900636 | 13900636 |
| | Throttle valve with adaptor for NPT 1 | 13900637 | 13900637 |
| HO EL* | Pincer head complete | 13900663 | 13900665 |
| | Replacement-jaw kit | 13900673 | 13900673 |
| | Spring accessory | 13900675 | 13900676 |
| | Calibration adaptor | 13900862 | 13900862 |

* also for ELT

** Low-profile clamp with single closure hook – only for 7 mm band width. Especially suitable for small low-profile clamps

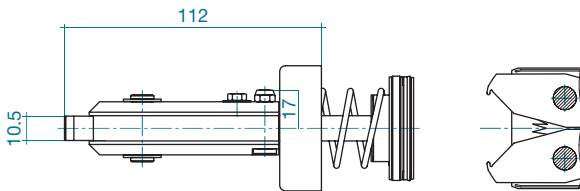
Pincer heads for installing StepLess® Low Profile Clamps with tolerance compensation – 168
 Compatible with pincer types HO 3000 and 4000.



| | |
|----------------|------|
| Pincer heads | RT 8 |
| Jaw width (mm) | 7.7 |

| Pincer types | | |
|--------------|----------------------|----------|
| HO ME | Pincer head complete | 13900670 |
| | Replacement-jaw kit | 13900673 |
| | Calibration adaptor | 13900862 |
| HO EL* | Pincer head complete | 13900669 |
| | Replacement-jaw kit | 13900673 |
| | Calibration adaptor | 13900862 |

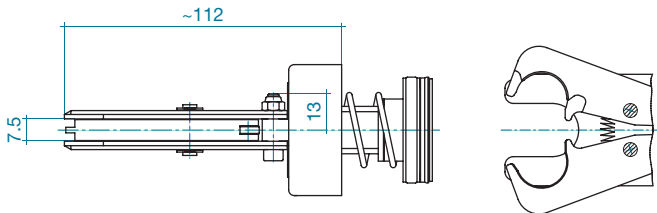
Pincer head for installing StepLess® Low Profile Clamp 192
 Compatible with pincer types HO 5000 EL and 7000 EL.



| StepLess® Low Profile Clamp 192 with tolerance compensation element 1/3 waves | |
|---|------|
| Pincer heads | |
| Jaw width (mm) | 10.5 |

| Pincer types | | |
|--------------|------------------------|----------|
| HO EL* | Pincer head complete | 13900555 |
| | Replacement-jaw kit | 13900556 |
| | Calibration adaptor EL | 13900495 |

Pincer head for installing Clamps ER – 194
 Compatible with pincer types HO 2000 to 4000 ME.



| | |
|----------------|-----|
| Pincer heads | |
| Jaw width (mm) | 7.5 |

| Pincer types | |
|--------------|------------|
| HO ME | On request |

* also for ELT



Efficient: quick, repeatable installation with exceptional accuracy

Convenient: cordless installation tool for ear clamps

Ergonomic and light: for easy, user-friendly handling

Process reliable: Monitoring and data collection of process parameters

Safeguarded settings: simple, tamper-proof closing force settings

LED display: indicates closing force quality, battery charge and service status

Extended maintenance intervals: to suit volume production applications

Cordless Clamp Pincer Oetiker CP 10, -20

Cordless CP 10 and CP 20 pincers are ideal alternatives to pneumatic tools where installation flexibility is of paramount importance. The tools guarantee a quick and effortless installation of Oetiker ear clamp models with high accuracy and excellent maneuverability in tight spaces.

The PC software included in the scope of supply enables easy, precise and tamper-proof adjustment of the closing force as well as the documentation and analysis of historical process data saved in the tool.

As an alternative to cordless battery operation, the CP pincers can also be used with an corded AC adapter.

The automatic ram retraction ensures the tool jaws return to their initial position after reaching the pre-set closing force. Furthermore, the tool has an emergency stop function which immediately stops jaw closure upon release of the trigger switch.

The 360° rotatable pincer head allows excellent maneuverability.

Oetiker CP 10, -20 scope of supply

- Cordless Clamp Pincers with 2 batteries (pincer head included depending on system chosen)
- PC software (for adjusting closing force, tool testing and retrieval of historical data)
- Technical manual (multilingual)
- Country-specific charger
- Carrying case

Technical Data*

CP 10

Closing force range: 800 N–4500 N**

External dimensions: 395 × 81 × 124 mm

Weight: 2500 g***

Closing time: 2 seconds

CP 20

Closing force range: 3500 N–10000 N**

External dimensions: 425 × 81 × 124 mm

Weight: 3100 g***

Closing time: 3–4 seconds

Accessories and Spare Parts for CP 10, -20

| | | |
|-----------------|-----------------------------|--------------------|
| Li-Ion battery | 18V 2.0Ah | Item no.: 14002340 |
| Li-Ion battery | 18V 3.0Ah | Item no.: 14002343 |
| Li-Ion battery | 18V 4.0Ah | Item no.: 14002346 |
| Battery charger | CLi 18V OEM-EU-230V/50Hz | Item no.: 14002339 |
| Battery charger | CLi 18V OEM-US-120V/60Hz | Item no.: 14002342 |
| Battery charger | CLi 18V OEM-AUS/NZ-230V | Item no.: 14002345 |
| Plug Adapter | UK-CH T23 | Item no.: 06001709 |
| AC adapter | 230V/50Hz-18V EU | Item no.: 14002341 |
| AC adapter | 120V/60Hz-18V US | Item no.: 14002344 |
| AC adapter | 230V/50Hz-18V AUS/ NZL | Item no.: 14002347 |

* Approximate information

** Adjustable closing force range, depending upon pincer head used. Closing force can be determined by:

- CAL 01
- SKM 01 and SKM 02

*** incl. 1 × 2 Ah battery and standard pincer head

Selection of complete pincer systems

A complete pincer system is made up of pincer head and pincer.

1) First, choose the pincer head according to requirement.

2) Then choose the pincer type in the corresponding columns below it. The item numbers for the pincer types include the complete scope of supply including the desired pincer head.

| | | | | | | |
|----------------|----------|----------|----------|----------|----------|----------|
| Pincer heads | CP 10 | CP 10 | CP 10 | CP 20 | CP 20 | CP 20 |
| Jaw width | 7.5 mm | 10.2 mm | 10.2 mm | 10.5 mm | 10.5 mm | 14.5 mm |
| Opening gap | 13.2 mm | 13.2 mm | 16.2 mm | 13.7 mm | 16.6 mm | 16.6 mm |
| For ear width* | 10 mm | 10 mm | 13 mm | 10 mm | 13 mm | 13 mm |
| Item no. | 13900683 | 13900659 | 13900725 | 13900662 | 13900660 | 13900711 |

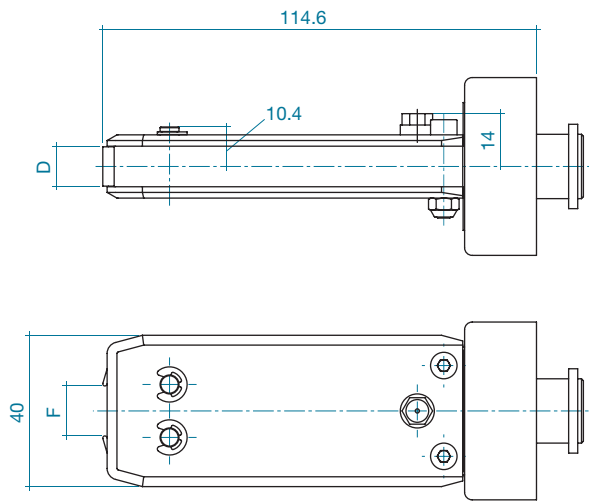
| | | | | | | | |
|---------------------------|----------|----------|----------|----------|----------|----------|-------------------------------|
| Selection of pincer types | | | | | | | CP sets without pincer head** |
| CP 10 (AUS) | 13900967 | 13900959 | 13900963 | – | – | – | 13901311 |
| Jaw replacement kit | 13900168 | 13900163 | 13900170 | – | – | – | – |
| CP 10 (EU) | 13900965 | 13900957 | 13900961 | – | – | – | 13901309 |
| Jaw replacement kit | 13900168 | 13900163 | 13900170 | – | – | – | – |
| CP 10 (UK) | 13900968 | 13900960 | 13900964 | – | – | – | 13901312 |
| Jaw replacement kit | 13900168 | 13900163 | 13900170 | – | – | – | – |
| CP 10 (US) | 13900966 | 13900958 | 13900962 | – | – | – | 13901310 |
| Jaw replacement kit | 13900168 | 13900163 | 13900170 | – | – | – | – |
| CP 20 (AUS) | – | – | – | 13900971 | 13900975 | 13900979 | 13901315 |
| Jaw replacement kit | – | – | – | 13900164 | 13900165 | 13900545 | – |
| CP 20 (EU) | – | – | – | 13900969 | 13900973 | 13900977 | 13901313 |
| Jaw replacement kit | – | – | – | 13900164 | 13900165 | 13900545 | – |
| CP 20 (UK) | – | – | – | 13900972 | 13900976 | 13900980 | 13901316 |
| Jaw replacement kit | – | – | – | 13900164 | 13900165 | 13900545 | – |
| CP 20 (US) | – | – | – | 13900970 | 13900974 | 13900978 | 13901314 |
| Jaw replacement kit | – | – | – | 13900164 | 13900165 | 13900545 | – |

* measured on the inside

** to suit regional power plug

Special Pincer Heads for CP 10

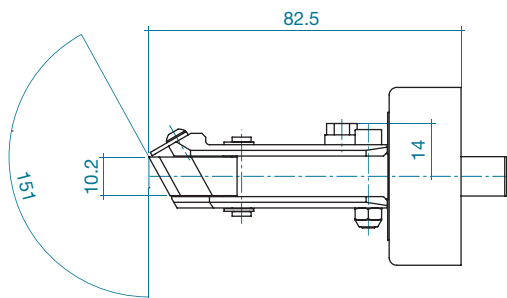
Pincer heads long, narrow



Pincer heads

| | | |
|---------------------|----------|----------|
| Jaw width D: | 10.2 mm | 7.5 mm |
| Opening gap F: | 13.2 mm | 13.2 mm |
| For ear width*: | 10 mm | 10 mm |
| Item no. | 13900800 | 13900822 |
| Jaw replacement kit | 13900163 | 13900168 |

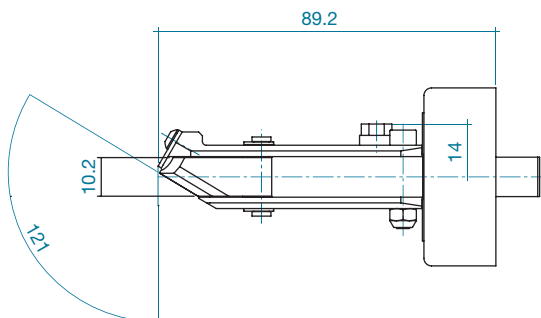
30° pincer heads



Pincer heads

| | |
|---------------------|----------|
| Jaw width: | 10.2 mm |
| Opening gap: | 13.2 mm |
| For ear width*: | 10 mm |
| Item no. | 13900724 |
| Jaw replacement kit | 13900708 |
| Calibration set | 13900722 |

60° pincer heads



Pincer heads

| | |
|---------------------|----------|
| Jaw width: | 10.2 mm |
| Opening gap: | 13.2 mm |
| For ear width*: | 10 mm |
| Item no. | 13900690 |
| Jaw replacement kit | 13900695 |
| Calibration set | 13900696 |

* measured on the inside

Hand installation pincers



| Tool type | Item No. |
|---|------------|
| For Ear Clamps | |
| Compound action standard jaw pincers | 14100386 |
| For Ear Clamps | |
| Compound action side jaw pincers | 14100387 |
| For Ear Clamps | |
| Single action standard jaw pincers* | 14100396 |
| Pincers with narrow jaws for limited space | 14100037 |
| For Ear Clamps | |
| Manual pincer with force monitoring with straight jaws Oetiker HMK 01 | On request |
| Manual pincer with force monitoring with side jaws Oetiker HMK S01 for limited space (image not shown) | On request |
| For 167 PEX (ASTM ¹ F 877/2098) | |
| 2-Handle Ratchet Pincer | 14100069 |
| 3-Handle Ratchet Pincer (image not shown) | 14100280 |
| Single handed assembly | |
| Lightweight design for ease of handling. When using Ratchet Pincers, tool will not release until the clamp is completely closed. Meets the specifications of ASTM Standard F2098. | |
| For Ear Clamps – Heavy Duty | |
| Pincer system**, consists of | |
| Clamping tool for standard clamps | 14100382 |
| Clamping tool 192 | 14100377 |
| Clamping tool 292 | 14100378 |
| Clamping tool 293 | 14100379 |
| Torque wrench | 14100098 |

¹ ASTM = American Society for Testing and Materials

* Available in select markets only

** Clamping tool and torque wrench must be ordered separately



| Tool type | Item No. |
|-----------|----------|
|-----------|----------|

| | |
|---|----------|
| For StepLess® Low Profile Clamps 192 Clamp pincers with special jaw form | 14100134 |
|---|----------|

| | |
|--|----------|
| For StepLess® Low Profile Clamps Pincers with return spring | |
| 5 mm wide | 14100031 |
| 7/10 mm wide | 14100030 |
| With tolerance compensation | 14100109 |

| | |
|---|------------|
| For Clamps ER Pincers with return spring | On request |
|---|------------|

| | |
|---|----------|
| For Screw Clamps/Worm Drive Clamps Torque wrench with digital display 1.0–5.0 Nm | 14100304 |
| Socket set bit for slotted-head screws | 14100306 |

| | |
|---|----------|
| Torque wrench with digital display 3.2–16 Nm | 14100307 |
| Socket set bit for hexagon-head screws (SW 7) | 14100308 |

| | |
|---|------------|
| Compound action ratchet pincers Available for Multi Crimp Rings diameters 5.0 – 11.0 mm | On request |
|---|------------|

| | |
|--|------------|
| Compound action heavy duty pincers Available for Multi Crimp Rings diameters 5.0 – 11.0 mm | On request |
|--|------------|

| | |
|---|------------|
| Compound action heavy duty pincers Available for Multi Crimp Rings diameters 10.0 – 17.0 mm | On request |
|---|------------|



Convenient: cordless assembly of small Multi Crimp Rings

Ergonomic and light: for easy, user-friendly handling

Process reliable: Monitoring and data collection of process parameters.

Effective: quick, precise swaging of Multi Crimp Rings in low volumes

LED display: indicates closing force quality, battery charge and service status

Extended maintenance intervals: to suit volume production applications

Cordless Crimp Pincer Oetiker CC 20

This cordless Crimp Pincer has been developed especially for the industry and trade sector so that Oetiker Multi Crimp Rings can be assembled economically in low volume production runs or in the field.

Multi Crimp Rings in the 5-25mm diameter range can be quickly and easily swaged using this tool.

Application specific sizes and crimping pincer jaw item numbers are defined by Oetiker Application Engineering or Power Tool Service Centers.

The PC software included in the scope of supply enables easy, precise and tamper-resistant adjustment of the process settings as well as the documentation and analysis of historical process data saved in the tool.

As an alternative to cordless battery operation, the CC pincers can also be used with a corded AC adapter.

The automatic ram retraction ensures the tool jaws return to their initial position after reaching the pre-set closing parameters. Furthermore, the tool has an emergency stop function which immediately stops jaw closure upon release of the trigger switch.

The 360° rotatable pincer head allows excellent maneuverability.

Technical Data* CC 20

External dimensions: approx. 476 × 81 × 124 mm

Weight: approx. 3300 g***

Closing time: 4–6 seconds

Oetiker CC 20 scope of supply

CC 20 cordless Crimp Pincer with 2 batteries

PC software (for adjusting the closing force, tool testing and retrieval of historical data)

Technical manual (multilingual)

Country-specific charger

Carrying case

Accessories and Spare Parts for CC 20

| | | |
|-----------------|-------------------------------|--------------------|
| Li-Ion battery | 18V 2.0 Ah | Item No.: 14002340 |
| Li-Ion battery | 18V 3.0 Ah | Item No.: 14002343 |
| Li-Ion battery | 18V 4.0 Ah | Item No.: 14002346 |
| Battery charger | CLi 18V OEM-EU-230V / 50Hz | Item No.: 14002339 |
| Battery charger | CLi 18V OEM-EU-120V / 60Hz | Item No.: 14002342 |
| Battery charger | CLi 18V OEM-AUS / NZ-230V | Item No.: 14002345 |
| Plug Adapter | UK-CH T23 | Item No.: 06001709 |
| AC adapter | 230V / 50Hz-18V EU | Item No.: 14002341 |
| AC adapter | 120V / 60Hz-18V US | Item No.: 14002344 |
| AC adapter | 230V / 50Hz-18V AUS / NZL | Item No.: 14002347 |

Size-specific pincer heads on request to 25 mm Multi Crimp Rings.

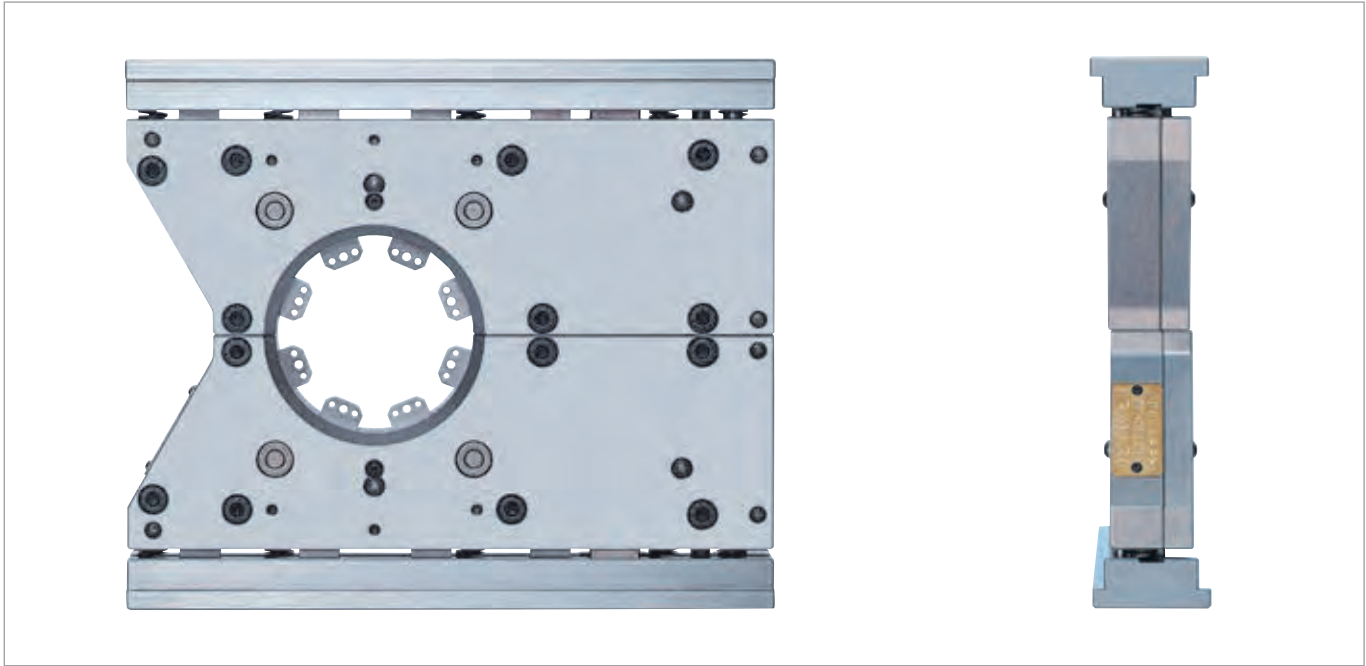
CC 20 Sets without pincer head**

| | |
|-------------|--------------------|
| CC 20 (EU) | Item No.: 13901008 |
| CC 20 (AUS) | Item No.: 13901010 |
| CC 20 (US) | Item No.: 13901009 |
| CC 20 (UK) | Item No.: 13901011 |

* Approximate information

** to suit regional power plug

*** incl. 1 × 2 Ah battery and standard pincer head



Cost effective tool solution

Small size allows flexibility

Two separate halves for optimum component access

Interlocking swaging segments guarantee 360° compression of MCR

Interchangeable swaging jaws enhance quick-change features

Optional arrangement enables 2 rings to be assembled ≥ 45 mm apart

Two-Piece Swaging Tool Oetiker Compact and Compact XL

For Multi Crimp Rings

Oetiker Multi Crimp Rings should be assembled using the swaging tools developed for them. This ensures correct assembly and the best possible product performance. The vertical-opening, Two-Piece Swaging Tool for Oetiker Multi Crimp Rings with its compact dimensions allows for the separation of the tool halves for optimum accessibility and automatic latching of the tool.

Powered by an external force – for example a hydraulic press – the jaws interact to reduce the MCR diameter. Because the jaw segments overlap, optimum compression of the ring is achieved.

| Tool type | Item No. |
|-------------------------|----------|
| Swaging Tool COMPACT | 13400538 |
| Swaging Tool COMPACT XL | 13401306 |

Technical data

External dimensions

Compact: 316 x 268 x 58 mm

Compact XL: 385 x 330 x 58 mm

Weight

Compact: 22 kg (48 lbs)

Compact XL: 35 kg (77 lbs)

MCR size range

Compact: Ring dimensions \varnothing 16 mm to \varnothing 60 mm

Compact XL: Ring dimensions \varnothing 16 mm to \varnothing 109 mm outside diameter with 8 replaceable swaging jaws

Ring width

7, 8, 9, 10 mm

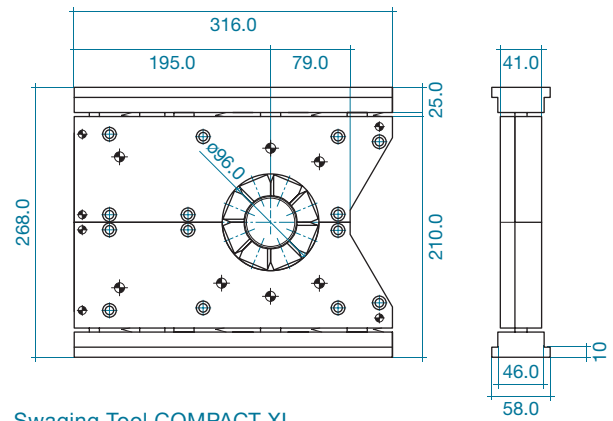
Press stroke

Segment stroke \varnothing 8 mm

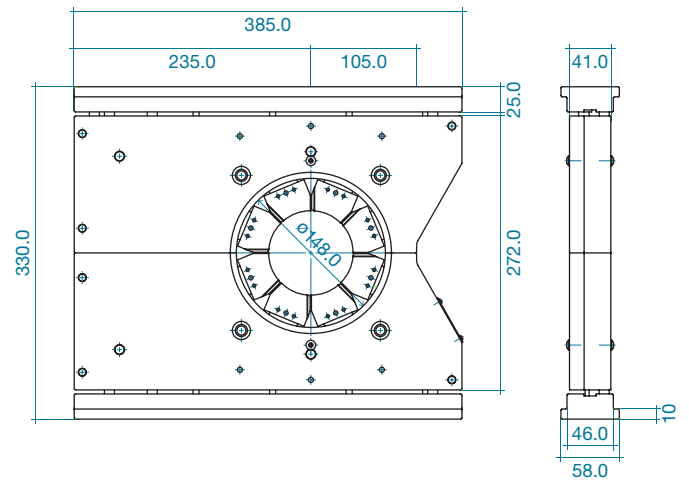
Minimal requirements for press (to be provided by customer)

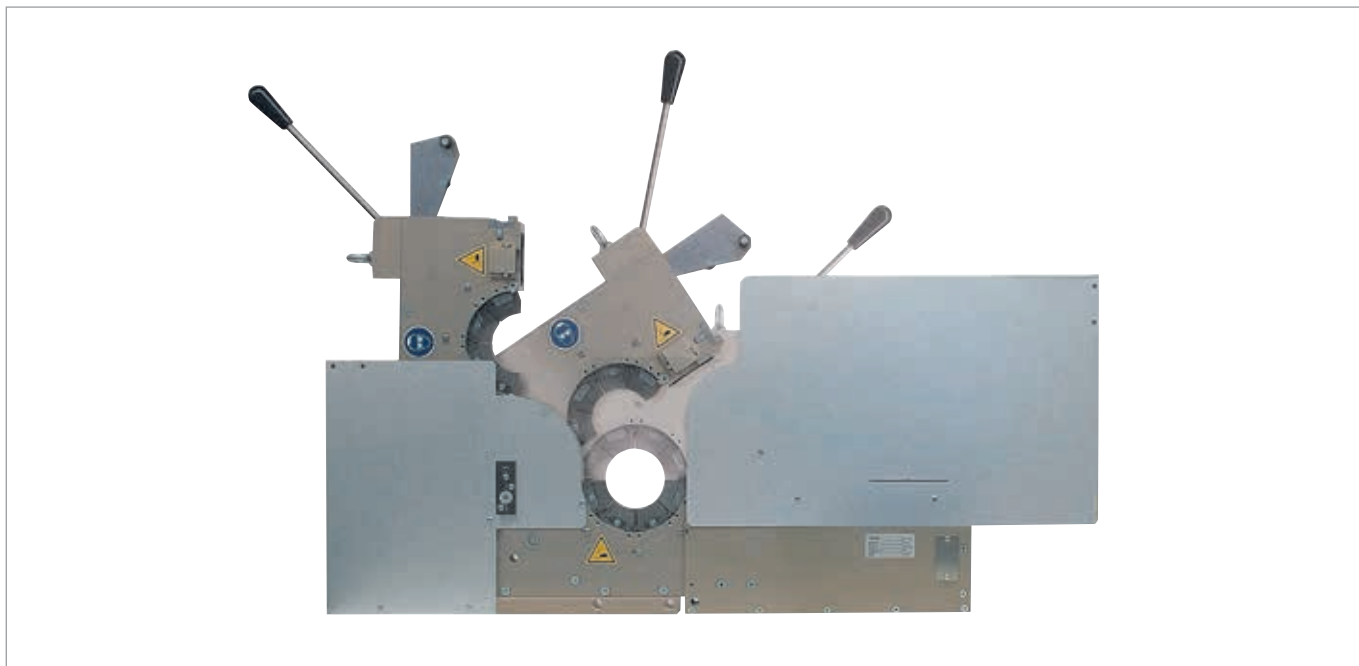
Press force: min. 5000 kg

Swaging Tool COMPACT



Swaging Tool COMPACT XL





Single hinge for optimum accessibility

Automatic locking when tool is activated

Minimal width for parallel operation, enabling multiple single-axis assembly

Intermeshing swaging segments guarantee 360° compression of Multi Crimp Rings

Interchangeable swaging jaws enhance quick-change features

Hydraulic Swaging Tool Oetiker Flex

For Multi Crimp Rings

Technical data

External dimensions

Complete system including mobile bench:

1550 x 1450 x 700 mm (l x h x w)

Swaging press: 1270 x 660 x 80 mm (l x h x w)

Weight

Including mobile bench and hydraulic unit: ca. 220 kg

MCR size range

Ring dimensions 16 mm to 120 mm outside diameter with 8 replaceable swaging jaws

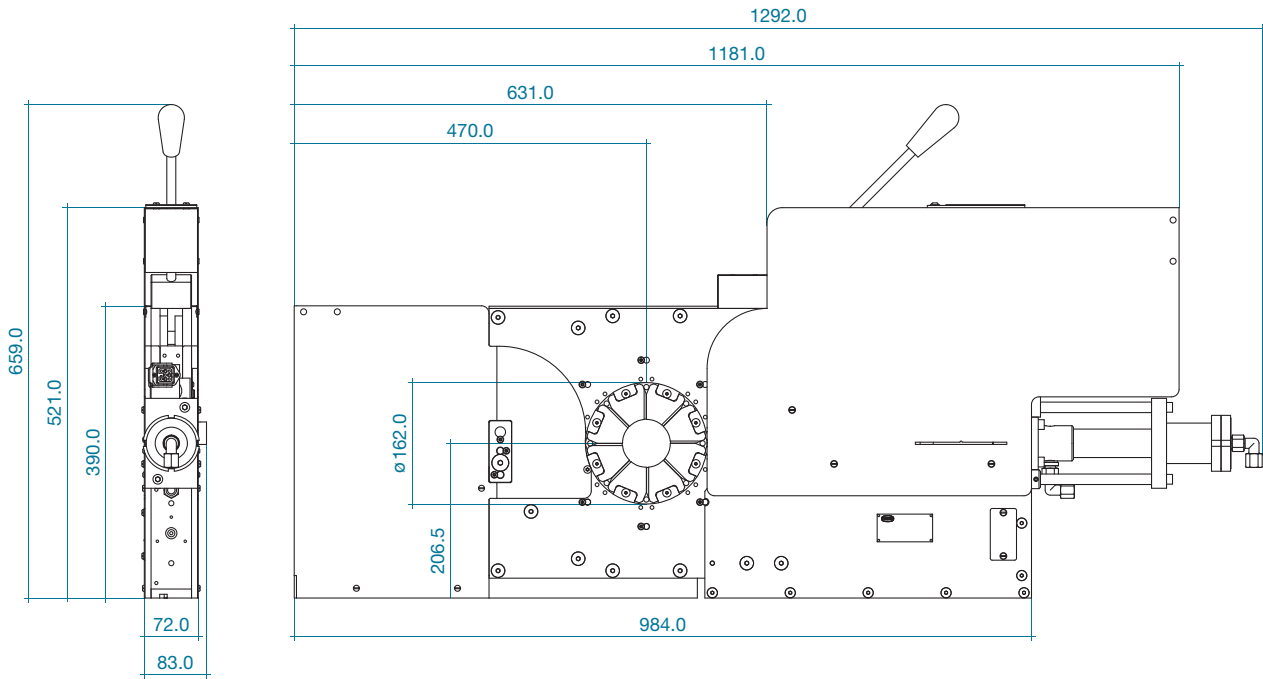
Ring dimensions 121 mm to 132 mm outside diameter with special slides and jaws

Press stroke

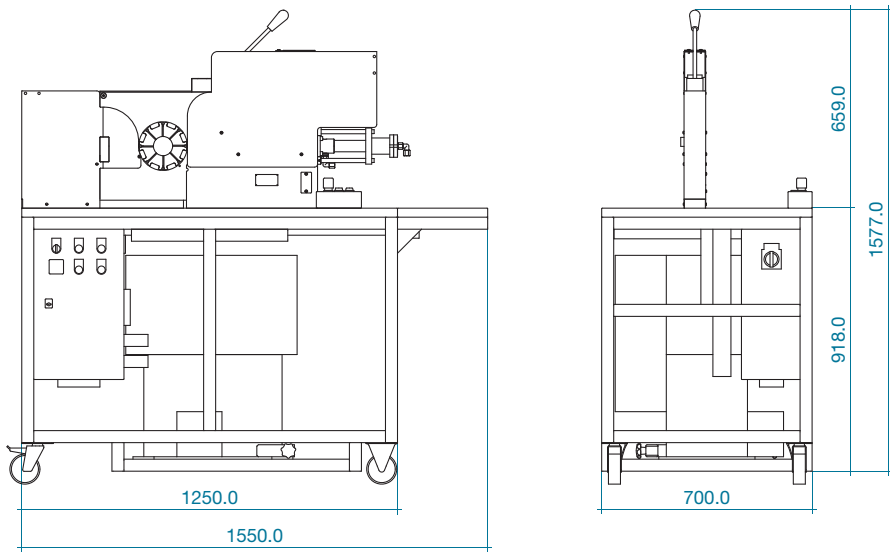
Segment stroke 8 mm

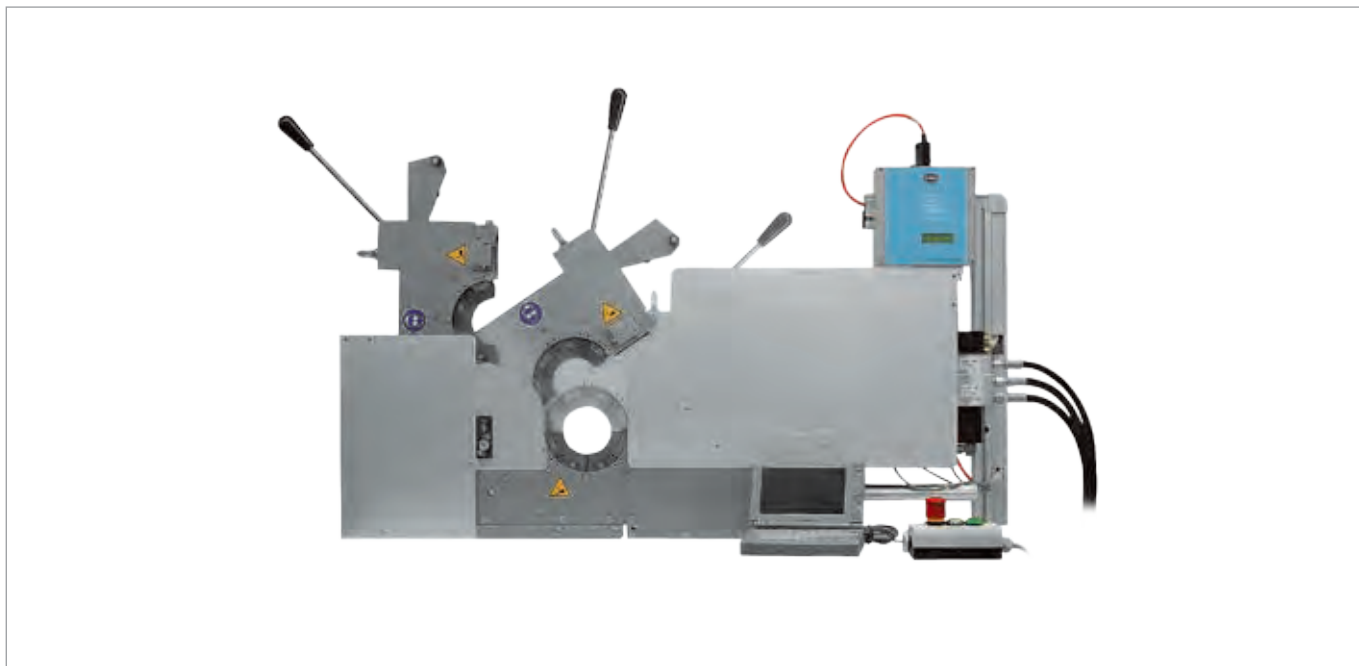
Oetiker Multi Crimp Rings (MCR) should be assembled using the swaging tools developed for them. This ensures correct assembly and the best possible product performance.

The hydraulic swaging tool Oetiker Flex has many advantages for industrial applications: For example, the tool can be opened for unrestricted accessibility with automatic latching and a very compact width. Powered by the integrated hydraulic drive, the jaws interact to reduce the MCR diameter. Because the jaw segments overlap, optimum compression of the ring is achieved.



| | |
|-------------------|----------|
| Tool type | Item No. |
| Swaging tool Flex | 13401010 |





Process reliable assembly with electronic monitoring of parameters

Tool hinged for optimum accessibility

Simultaneous closure of multiple MCRs supported

Intermeshing swaging segments guarantee 360° compression of Multi Crimp Rings

Interchangeable swaging jaws enhance quick-change features

Electronically Controlled Hydraulic Swaging Tool Oetiker ELS 01

For Multi Crimp Rings

Technical Data

External dimensions

Complete system including mobile bench:

1550 x 1800 x 700 mm (l x h x w)

Swaging press: 1270 x 660 x 80 mm (l x h x w)

Weight

Including mobile bench and hydraulic unit: ca. 240 kg

MCR size range

Ring dimensions 16 mm to 120 mm outside diameter with 8 replaceable swaging jaws

Ring dimensions 121 mm to 132 mm outside diameter with special slides and jaws

Press stroke

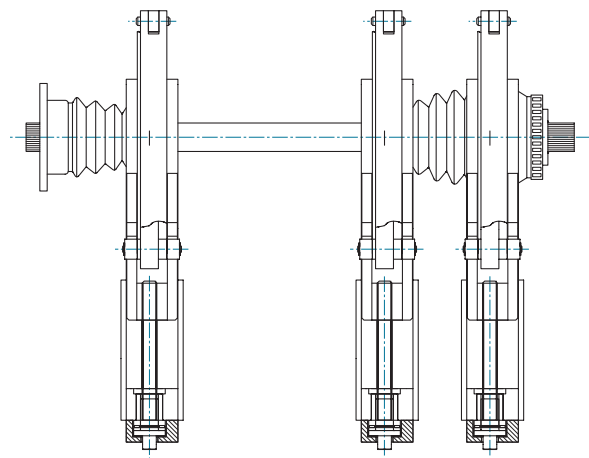
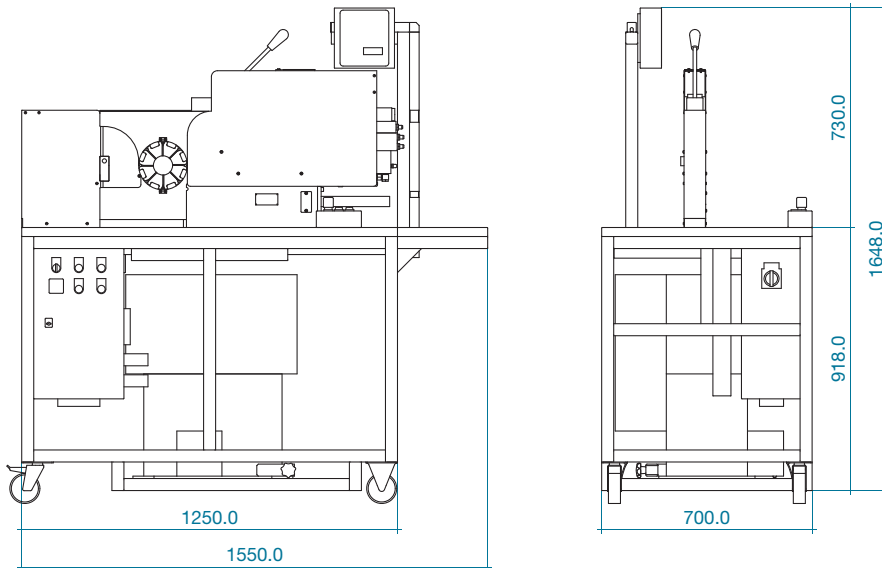
Segment stroke 8 mm

Oetiker Multi Crimp Rings should be assembled using the swaging tools developed for them. This ensures correct assembly and the best possible product performance.

The electronically controlled Swaging Tool Oetiker ELS 01 is an innovative closing concept providing reliable assembly with electronic monitoring of all specified parameters. This tool offers many advantages for automotive and industrial applications, e.g. integration in automated processes, convenient programming using a PC, optimum component accessibility, automatic locking of the tool mechanism and low width. Powered by the integrated hydraulic drive, the jaws interact to reduce the MCR diameter.

Because the jaw segments overlap, optimum compression of the ring is achieved. Swaging can be carried out with either force or diameter priority. When using the force-priority method, the assembly of Oetiker Multi Crimp Rings can compensate for variations in component tolerances. In addition, 100% documentation of closures is available by using the optional "Clamp Process Monitoring" software.

The thrust force of the hydraulic cylinder is set by changing the parameters at the ELS 01 control unit. This is accomplished by means of a PC, programming the specifications of a sequence of consecutive assemblies, or, optionally, using an external control signal. Specially adapted Test and Calibrating Equipment, based on the Calibrator CAL 01, is employed to calibrate the thrust force.



Example of an arrangement of swaging tools.
Rings can be closed simultaneously.

| Tool type | Item No. |
|---------------------------------------|------------|
| Swaging tool ELS 01 | |
| With 3 x 400V/50–60Hz mains voltage | 13401011 |
| For other voltages | on request |
| CPM Clamp Process Monitoring Software | 13600121 |
| Calibrating Equipment for ELS 01 | on request |
| Calibration gauges | on request |



Ensures uniform, reproducible process quality

Provides an interface for data exchange with any Oetiker electronically controlled assembly tool

AC or DC operation

Convenient carrying case

Test Equipment Oetiker CAL 01

Closing forces for Oetiker Clamps

All types of Oetiker Ear Clamps and Low Profile Clamps that can be closed using a pneumatic pincer should be closed with a recommended, uniform force. This results in a constant, reproducible tensile stress in the clamp material within the permissible limits and without overloading the individual elements of the assembly.

The "Test Equipment CAL 01" is used to adjust and verify the applied closing force. To determine the recommended closing force for a specific product, please refer to the respective clamp data.

Important

To comply with applicable local standards for test equipment, the CAL 01 should be calibrated at least once a year by an authorized institution. Please contact Oetiker regarding this service.

Technical Data Oetiker Test Equipment Cal 01

| | |
|----------------------|---|
| Operating voltage: | 100–200 V / 47–63 Hz |
| Current consumption: | 400 mA |
| External dimensions: | 190 x 110 x 60 mm |
| Weight: | 0.8 kg (CAL 01), 3.4 kg (complete case) |

Delivery scope Oetiker Test equipment CAL 01

| |
|--|
| Calibrator CAL 01 with technical description and operating instructions |
| Coded load cell (SKS 01), assembled with 10 mm wide interchangeable pressure jaws (SKB 10) |
| 7 mm wide pressure jaws (SKB 07) |
| Check gauge |
| Power transformer compatible with local supply |
| Data cables for communication with PC, PLC and ELK / ELS |
| Lithium block battery (BAT 01) |

| Oetiker Test Equipment CAL 01 versions | Item No. |
|--|----------|
| German | 13600068 |
| French | 13600075 |
| Dutch | 13600076 |
| Italian | 13600077 |
| Spanish | 13600078 |
| Swedish | 13600079 |
| English (UK) | 13600080 |
| English (USA) | 13600081 |
| English (Australia) | 13600082 |
| English (China) | 13600155 |

| Optional accessories and spare parts | Item No. |
|--|----------|
| Mains-plug charger for block battery 9V 230V/50Hz, EURO plug | 06001158 |
| Block battery 9V | 06001157 |
| Lithium block battery 9V (BAT 01) | 06001165 |
| Mains unit 100...230V, EURO (STN 01) | 06001159 |
| Mains unit 100...230V, UK (STN 02) | 06001166 |
| Mains unit 100...230V, USA (STN 03) | 06001167 |
| Mains unit 100...230V, Australia (STN 04) | 06001168 |
| Pressure jaws SKB05 (jaw width 5 mm) | 13600060 |
| Pressure jaws SKB05** (jaw width 5 mm) | 13600294 |
| Pressure jaws SKB07 (jaw width 7 mm) | 13600059 |
| Pressure jaws SKB10 (jaw width 10 mm) | 13600058 |
| Guard* for HO 2000 to 4000 (SVG01) | 13600070 |
| Guard* for HO 5000 and 7000 (SVG02) | 13600071 |

* The guards SVG01/02 surround the pincer head, and at the same time hold the SKS 01 in position so that the danger zone is protected. These guards should be used when the CAL 01 is used to carry out automatic Cmk checks

** for opening gap < 7.5 mm and closing force up to 2 kN.



- Mechanical alternative for closing force calibration
- Ensures uniform and reproducible process quality
- Force is determined from a conversion table
- Covers the entire standard range of closing forces
- Provides electronic data exchange in combination with a suitable digital gauge

Test Equipment Oetiker CAL 02

Mechanical alternative to Test Equipment CAL 01. High accuracy – especially suitable for mechanical tools.

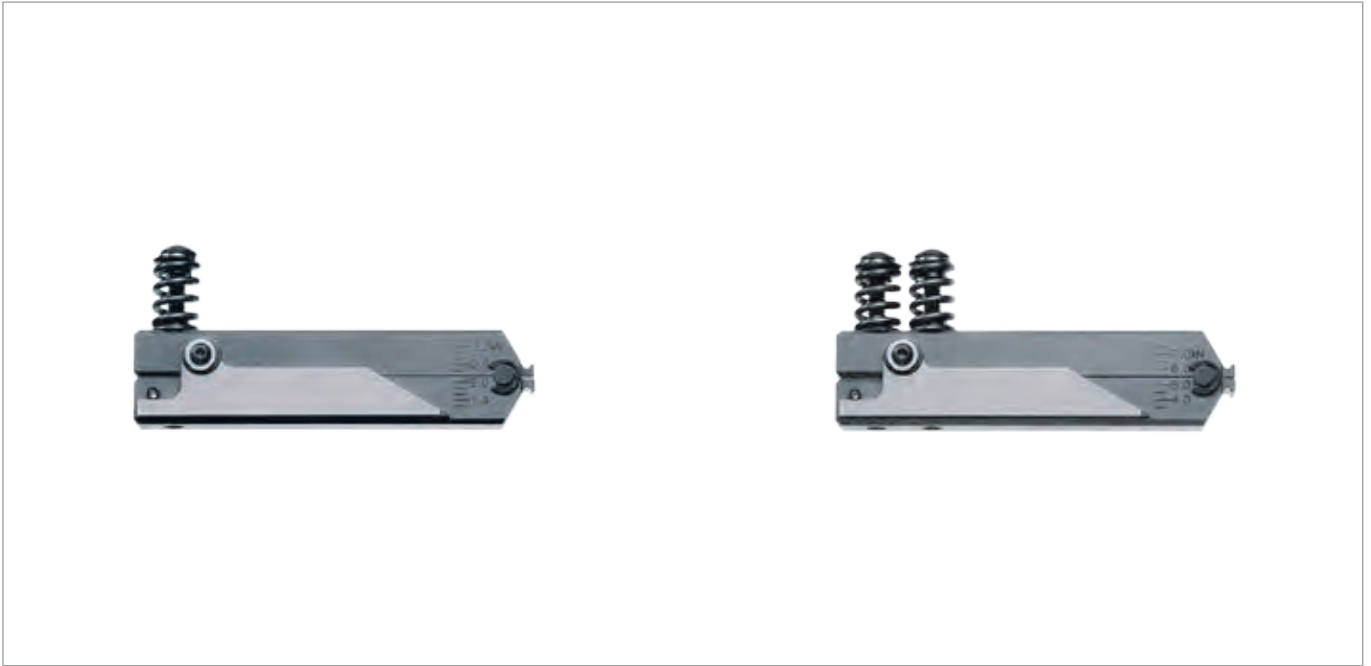
| Versions | Item No. |
|---|----------|
| With MarCator 1087 digital gauge ¹ | 13600243 |
| With MarCator 1081 digital gauge ² | 13600244 |
| Without dial gauge | 13600245 |

Delivery scope

- Digital gauge (electronic data exchange, depends on version)
- Closing force sensor (SKS 02), fitted with closing force lugs 10 mm wide (SKB 10)
- Operating instructions
- Transport case
- Adhesive Loctite 243
- Socket wrench SW 2.5
- Socket wrench SW 3

¹ with electronic data exchange

² without electronic data exchange



- Economical alternative for closing force calibration
- Force indicated by a pointer on a scale
- Ensures uniform and reproducible process quality
- Three models available to suit closing force range
- Developed for ear clamp assembly tools
- Robust plastic carrying case

Test Equipment Oetiker SKM 00, -01, -02

Closing Force Gauges SKM 01/02 offer economical solutions for verifying the closing forces in small series and service applications. Suitable for calibrating assembly tools for ear clamps.

| Types of Oetiker Closing Force Gauges | Item No. |
|---------------------------------------|----------|
| Oetiker SKM 00 | 13900833 |
| Oetiker SKM 01 | 13900631 |
| Oetiker SKM 02 | 13900632 |

- Delivery scope
- Oetiker SKM 00, -01, -02
- [Closing Force Gauge](#)
- [Operating instructions](#)

Technical data SKM 00, -01

| | |
|-----------------------------|------------------------|
| Dimensions: | ca. 100 x 19.5 x 44 mm |
| Weight: | ca. 230 g |
| Closing force range SKM 00: | 600 N–2000 N |
| Closing force range SKM 01: | 1200 N–3400 N |
| Graduation: | 200 N |

Technical data SKM 02

| | |
|----------------------|------------------------|
| Dimensions: | ca. 100 x 19.5 x 44 mm |
| Weight: | ca. 240 g |
| Closing force range: | 3500 N–7500 N |
| Graduation: | 500 N |

Quick Connectors

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Quick Connector
thread-optimized range



Tool-free assembly

Highly space-efficient

Simple, robust modular design

Oetiker will be pleased to help you to find the correct choice for your application... Our standard includes the thread-optimized and the length-optimized series. Variants for adaptation to customer-specific conditions are possible.

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Quick Connector
length-optimized range



Quick Connector
thread-optimized range



Quick Connector
length-optimized range



Quick, tool-free push-in connection

Space-saving compact one-piece design with maximum flow

Flexible and easy to integrate: thread- and length optimized range

Heat-resistant, robust, tamper-proof

Quick Connectors 200

Material

Body: Material No. 1.0737/UNS G12144

Protection against corrosion on request

Circlip: Material No 1.4310/UNS S30100

O-Ring: According to requirements

Use

Oetiker Quick Connectors (QC) are an innovative connecting solution for pressure lines carrying media. They enable significant savings in assembly time, space required, and assembly costs to be made.

Thanks to tool-free assembly, Oetiker QC are an optimal solution for many applications and are particularly suitable as a connecting element for oil and / or coolant lines to turbochargers, transmissions, and radiators.

Process monitoring

Process monitoring is carried out mechanically. With appropriate modification of the plug or tube, visual process monitoring is also possible.

Temperature range

The temperature range is dependent on the material of the O-ring. This is determined according to the requirements.

Functionality



To make the connection, push the grooved tube/adaptor into the Quick Connector until it engages. We recommend verifying correct insertion of each pipe by means of manual pull testing. Locking of the pipe/insertion nipple in the QC takes place by means of the groove in the pipe, the groove system in the QC and the circlip – an especially space-saving solution allowing the smallest of QC diameters.



To disconnect, push the disconnection sleeve/pincer into the Quick Connector to the stop, hold it in this position, and pull out the tube/adaptor.

Performance

Operating pressure

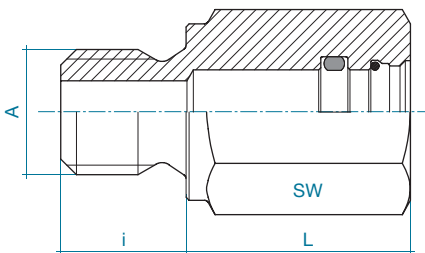
The permissible operating pressure is directly dependent on the O-ring selected, the temperature, and the quality of the male component. It must always be determined in relation to the application.

| | |
|----------|----------|
| DN8–DN18 | < 40 bar |
|----------|----------|

Pull-out load on QC tube

| DN | |
|----|----------|
| 8 | > 1800 N |
| 10 | > 2000 N |
| 12 | > 2200 N |
| 15 | > 2400 N |
| 18 | > 2600 N |

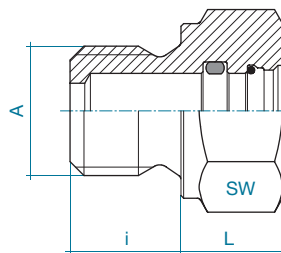
thread-optimized range



| DN | A | i | L | SW |
|----|-----------|------|------|------|
| 8 | M12 x 1.5 | 12.0 | 21.5 | 17.0 |
| 10 | M14 x 1.5 | 12.0 | 22.0 | 19.0 |
| 12 | M16 x 1.5 | 12.0 | 23.0 | 22.0 |
| 15 | M18 x 1.5 | 12.0 | 24.0 | 24.0 |
| 18 | M22 x 1.5 | 14.0 | 27.0 | 27.0 |

Lengths in mm

length-optimized range



| DN | A | i | L | SW |
|----|-----------|------|------|------|
| 8 | M14 x 1.5 | 12.0 | 11.0 | 19.0 |
| 10 | M16 x 1.5 | 12.0 | 12.0 | 22.0 |
| 12 | M18 x 1.5 | 12.0 | 13.0 | 24.0 |
| 15 | M22 x 1.5 | 14.0 | 13.0 | 27.0 |
| 18 | M27 x 2.0 | 16.0 | 14.0 | 32.0 |

Lengths in mm