

Technical Data Sheet

Adjustable Clamps

Product Group 109, 159 & 163



Connecting Technology



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 installation, 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 Product Group 109, 159 & 163

Material

PG 109 zinc-plated steel band

PG 159 & 163 Stainless Steel, Material no. 1.4301/UNS S30400

Corrosion resistance according to DIN EN ISO 9227

PG 109 \geq 96 h

PG 159 \geq 1000 h

PG 163 \geq 1000 h

Adjustable Clamps PG 109

| Size range | width x thickness |
|-----------------|-------------------|
| 29.5 – 122.0 mm | 7.0 x 0.75 mm |
| 29.5 – 122.0 mm | 9.0 x 0.75 mm |

Adjustable Clamps PG 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* |

Adjustable Clamps with radial guiding PG 163

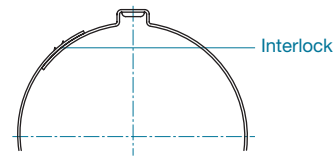
| Size range | width x thickness |
|-----------------|-------------------|
| 30.0 – 116.0 mm | 7.0 x 0.6 mm |
| 72.0 – 132.0 mm | 9.0 x 0.6 mm |

* Diameter range covered by a single clamp

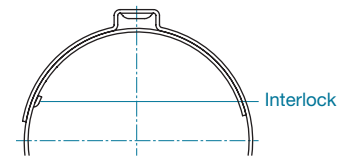
Some sizes are only available if an appropriate minimum quantity is ordered.

PG 159 – Adjustable Clamps:

PG 109/159 – Adjustable clamp:



Version with interlock outside
May make installation easier



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.

Adjustable Clamps with 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**Product Group 163 – Adjustable Clamps with radial guiding**

The clamp can be installed 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.

Product Group 109&159 – Adjustable Clamps

PG 109 Adjustable Clamps are supplied pre-shaped and engaged at mid-diameter. PG 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.

Clamp installation monitoring and process data collection are available by incorporating an “Electronically Controlled Pneumatic Power Tool Oetiker ELK” in the assembly process.

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.

Installation data

| Material dimensions (mm) | Size (mm) | Closing force max. (N) | Installation tools force-monitored ¹ : | | | |
|--------------------------|--------------|------------------------|---|-------------------|----------|---------------------------|
| | | | Manual | Pneumatic | Cordless | Electronically controlled |
| PG 109 | | | | | | |
| 7 x 0.75 | 29.5 – 122.0 | 1400 | HMK 01/S01 | HO ME 2000 | CP 01 | HO EL 2000 |
| 9 x 0.75 | 29.5 – 122.0 | 1800 | HMK 01/S01 | HO ME 2000 | CP 01 | HO EL 2000 |
| PG 159 | | | | | | |
| 7 x 0.8 | 25.0 – 50.0 | 2400 | HMK 01 | HO ME 3000 | CP 01 | HO EL 3000 |
| 7 x 0.8 | 40.0 – 110.0 | 2400 | HMK 01 | HO ME 3000 | CP 01 | HO EL 3000 |
| PG 163 | | | | | | |
| 7 x 0.6 | 30.0 – 50.0 | 1800 | HMK 01/S01 | HO ME 2000 – 3000 | CP 01 | HO EL 2000 – 3000 |
| 7 x 0.6 | 56.0 – 116.0 | 2400 | HMK 01 | HO ME 3000 | CP 01 | HO EL 3000 |
| 9 x 0.6 | 72.0 – 132.0 | 2800 | - | HO ME 3000 | CP 01 | HO EL 3000 |

For an alternative option, see our manual pincers on page 104

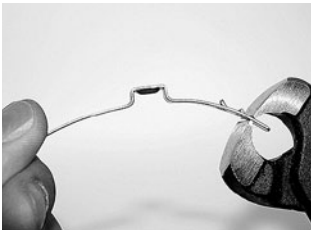
¹ Further information on page 84

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

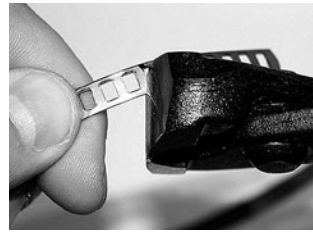
PG 159 – Version with interlock outside



Step 1
Pre-shape clamp.



Step 2
Determine the clamp length.

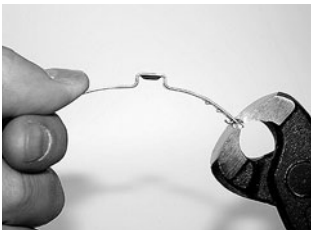


Step 3
Cut off the remaining material.
To avoid possible injury deburr
cut edges with a file.

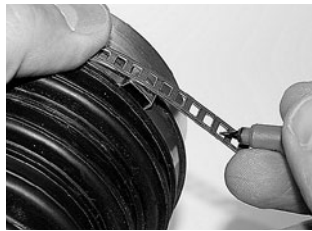


Step 4
Place the clamp over object.
Engage interlocking hooks
in tightest window position.
Firmly crimp the ear with
Oetiker pincers.

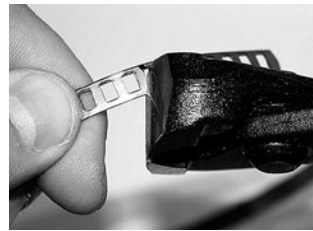
PG 109 & 159 – Version with interlock inside



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) |
|----------|------------|---------------------|
|----------|------------|---------------------|

Product Group 109

Band width 7 mm, thickness 0.75 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 0.75 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 |

Product Group PG 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 |

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

Product Group 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.

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