

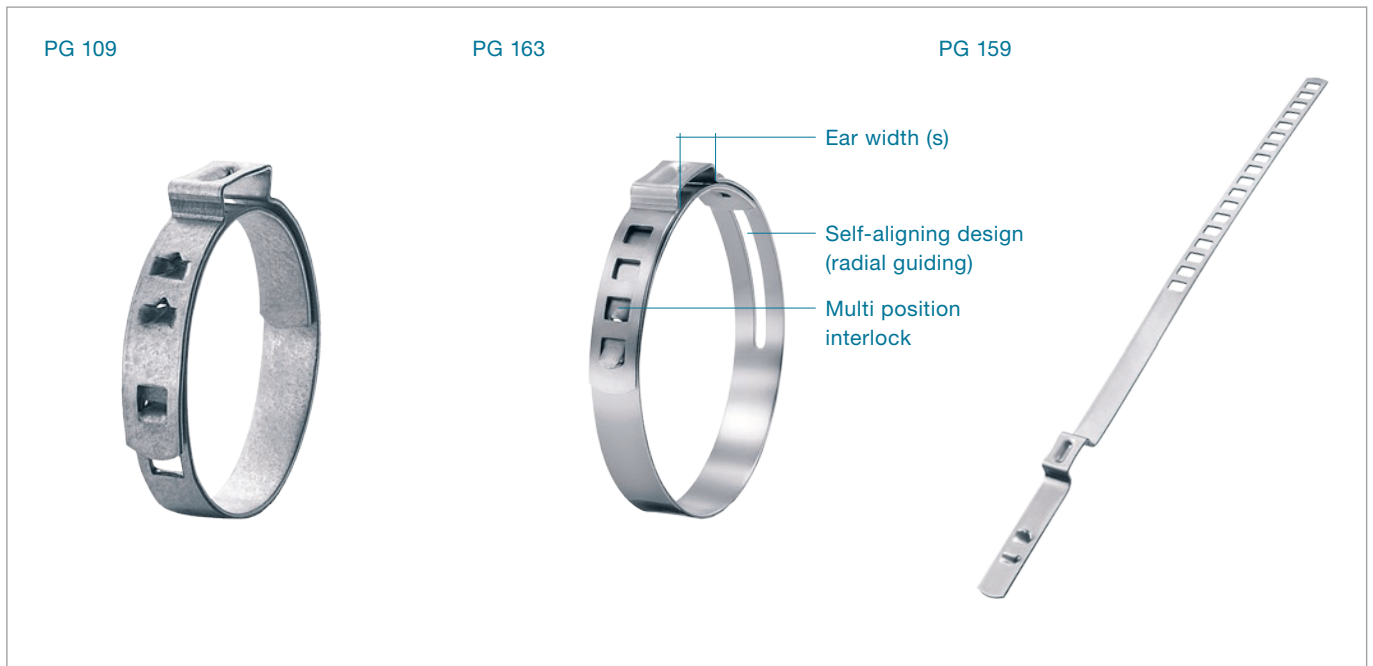
Technical Data Sheet

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 0.8 mm

29.5 – 122.0 mm 9.0 x 0.8 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

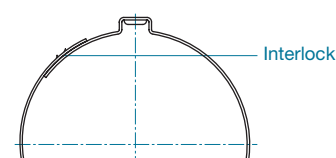
30.0 – 116.0 mm 7.0 x 0.6 mm

72.0 – 132.0 mm 9.0 x 0.6 mm

* Diameter range covered by a single clamp

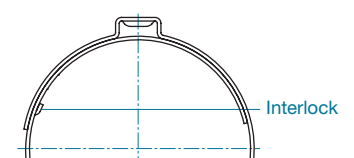
Some sizes are only available if an appropriate minimum quantity is ordered.

PG 159 – Adjustable Clamps:



Version with interlock outside
May make installation easier

PG 109/159 – Adjustable clamp:



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 0.8	29.5 – 122.0	1400	HMK 01/S01	HO ME 2000	CP 01	HO EL 2000
9 x 0.8	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

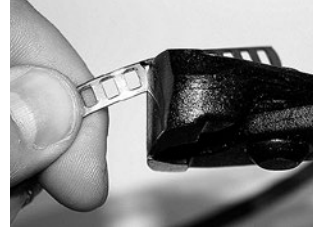
PG 159 – Version with interlock outside



Step 1
Pre-shape clamp.



Step 2
Determine the clamp length.

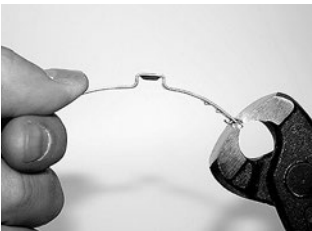


Step 3
Cut off the remaining material.
To avoid possible injury deburr
cut edges with a file.



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

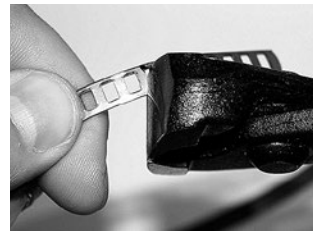
PG 159 – Version with interlock inside



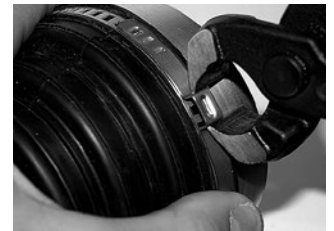
Step 1
Pre-shape clamp.



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)	Item No.	Ref. size*	Diameter range (mm)	Diameter range (inch)
Product Group 109			Product Group 163			
Band width 7 mm, thickness 0.8 mm, Ear width 10 mm			3 adjustment positions			
Band width 9 mm, thickness 0.8 mm, Ear width 10 mm			Band width 7 mm, thickness 0.6 mm, Ear width 10 mm			
10900012	29.5	24.5 – 29.5	16300022	30	23.6 – 30.0	0.929 – 1.181
10900016	34.2	29.5 – 36.0	16300179	32	25.6 – 32.0	1.008 – 1.260
10900018	42.3	36.0 – 45.5	16300023	35	28.6 – 35.0	1.126 – 1.378
10900020	55.1	45.5 – 61.5	16300251	37	30.6 – 37.0	1.205 – 1.457
10900022	74.3	61.5 – 85.5	16300024	40	33.6 – 40.0	1.323 – 1.575
10900014	106.1	85.5 – 122.0	16300025	45	38.6 – 45.0	1.520 – 1.772
Product Group PG 159			6 adjustment positions			
Band width 7 mm, thickness 0.8 mm, Ear width 8.5 mm			Band width 7 mm, thickness 0.6 mm, Ear width 10 mm			
Version with interlock outside			16300027			
15900002		25.0 – 50.0	56	47.5 – 56.0	1.870 – 2.205	
15900004		40.0 – 110.0	16300028	62	53.5 – 62.0	2.106 – 2.441
Version with interlock inside			16300029	68	59.5 – 68.0	2.343 – 2.677
15900005		25.0 – 50.0	16300030	74	65.5 – 74.0	2.579 – 2.913
15900007		40.0 – 110.0	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.

The Oetiker Group: www.oetiker.com

Headquarters Switzerland

Hans Oetiker AG
Maschinen- und Apparatefabrik
Oberdorfstrasse 21
CH-8810 Horgen (Zürich)
T +41 44 728 55 55
info@ch.oetiker.com

Austria

Hans Oetiker
Maschinen- und Apparatebau
Ges.m.b.H.
Eduard-Klinger-Strasse 19
A-3423 St. Andrä-Wördern
T +43 2242 33 994-0
info@at.oetiker.com

Brazil

Oetiker do Brasil Imp. e Com. Ltda.
Av. Hugo Fumagali, nr. 586 - Sala B
07220-080 Cid. Industrial Satélite
Guarulhos (SP)
T +55 11 2303 7486
info@br.oetiker.com

Canada

Oetiker Limited
203 Dufferin Street South
P. O. Box 5500
Alliston, Ontario L9R 1W7
T +1 705 435 4394
info@ca.oetiker.com

P. R. China

Oetiker Industries (Tianjin) Ltd.
10 Shuangchenzhong Road
Beichen High Tech Industrial Park
Tianjin 300400
T +86 22 2697 1183
info@cn.oetiker.com

Czech Republic

Hans Oetiker spol. s r. o.
Videňská 116
CZ-37833 Nová Bystřice
T +420 384 386513
info@cz.oetiker.com

France

Oetiker Sarl
Parc d'activités du Bel Air
1, rue Charles Cordier
77164 Ferrières-en-Brie
T +33 1 79 74 10 90
info@fr.oetiker.com

Germany

Hans Oetiker
Metallwaren- & Apparatefabrik GmbH
Üsenbergerstrasse 13
D-79346 Edingen a. K.
T +49 76 42 6 84-0
info@de.oetiker.com

Kurt Allert GmbH & Co. KG

Postfach 1160
Austrasse 36
D-78727 Oberndorf a. N.
T +49 74 23 87 70-0
info@allert.oetiker.com

Hong Kong

Oetiker Far East Limited
2210 Tuen Mun Central Square
22 Hoi Wing Road
Tuen Mun NT
T +852 2459 8211
info@hk.oetiker.com

Hungary

Oetiker Hungaria KFT
Vasvári P. U. 11
H-9800 Vasvár
T +36 94 370 630
info@hu.oetiker.com

India

Oetiker India Private Ltd.
N-14, Additional Patalganga
Industrial Area
Village Chavane, Khalapur
Rasayani 410 220
Dist. Raigad, Maharastra
T +91 2192 250107-12
info@in.oetiker.com

Japan

Oetiker Japan Co. Ltd.
Kaneko Bldg. A
5-3-5 Nakamachi-dai, Tsuzuki-ku
Yokohama 224-0041, Kanagawa
T +81 45 949 3151
info@jp.oetiker.com

Mexico

Oetiker Servicios S de RL de CV
Ave. José María Pino Suárez 853 Nte.
Col. Centro, CP 64000
Monterrey, Nuevo León
T +52 81 8390 0237
info@mx.oetiker.com

Netherlands

Oetiker Benelux B. V.
Hertzstraat 38
NL-6716 BT Ede
T +31 318 63 71 71
info@nl.oetiker.com

Spain

Oetiker España, S. A.
Pol. Ind. Las Salinas
C/Puente, 18
E-11500 El Puerto
de Santa María (Cádiz)
T +34 956 86 04 40
info@es.oetiker.com

South Korea

Oetiker Far East Limited
Korea Liaison Office
Postal Zip Code 135-880
1401 LG Twintel 1-Cha 157-8
Samseong 1-dong
Gangnam-gu, Seoul
T +82 2 2191 6100
info@kr.oetiker.com

United Kingdom

Oetiker UK Limited
Foundry Close
GB-Horsham, Sussex RH13 5TX
T +44 1403 26 04 78
info@uk.oetiker.com

USA

Oetiker, Inc.
6317 Euclid Street
Marlette, Michigan 48453-0217
T +1 989 635 3621
800 959 0398 (toll-free)
info@us.oetiker.com

www.oetiker.com

