

TYPES

- Type **A**: Steel contact plate with setting nut
- Type **B**: Steel contact plate without setting nut

Lever

Steel (precision casting)

Zinc plated, blue passivated **Z**

Pin, lag nut / screw

Setting nut / screw (only type A)

Zinc plated steel, blue passivated

Contact plates

Steel

- Zinc flake coated

- Case-hardened

FEATURES AND APPLICATIONS

Clamping levers with eccentric cam GN 927.2 are used for rapid clamping and releasing. Contrary to a clamping operation via a thread, these levers permit torque-free clamping.

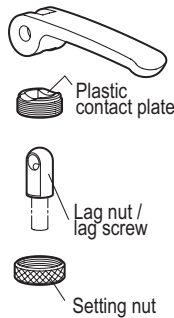
The lever has been designed to ensure that its movement cannot exceed the max. clamping force. There are no loose components since they are all assembled and mounted in their correct order.

To achieve maximum clamping forces, the clamping surface is lightly greased and should be relubricated as required.

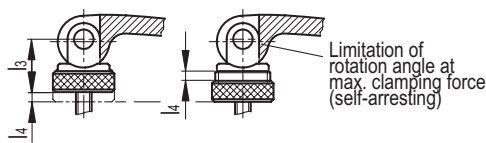
Type A has the following advantages: The distance between the eccentric cam and the contact surface is adjustable by means of a fine threaded setting nut. This allows the max. clamping force to be set by a simple adjustment. In addition, this also allows the choice of the preferred lever position in relation to the clamping lever pin.

ON REQUEST

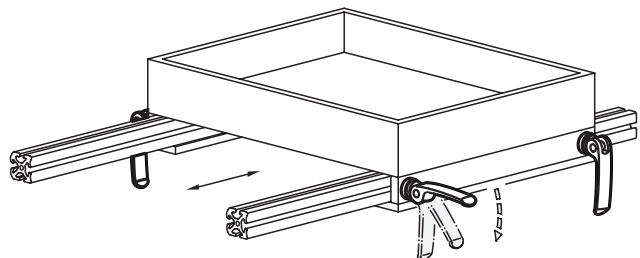
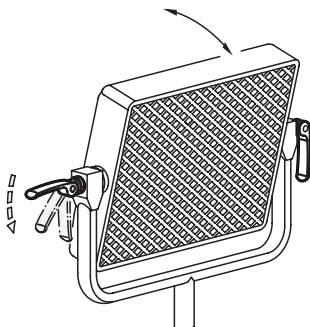
- Clamping surface free of grease
- Other finishes

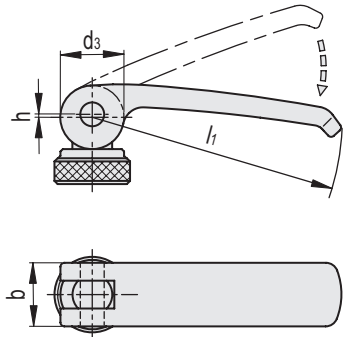


l_4 adjustable by the setting screw for optimum clamping force at the preferred lever position

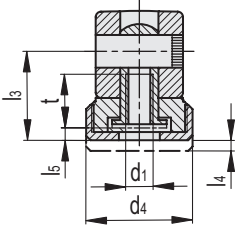


l_4 must not be exceeded. Otherwise there is the risk that the positioning thread can no longer absorb the clamping force or may be damaged.

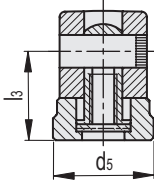




GN 927.2-A (d1)



GN 927.2-B (d1)

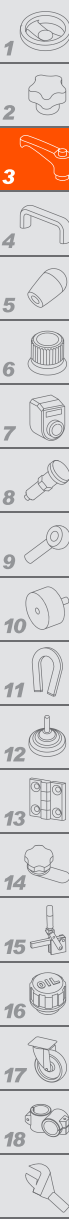


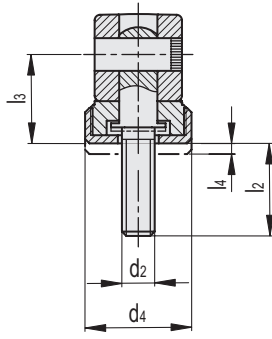
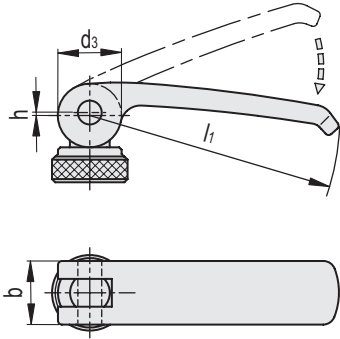
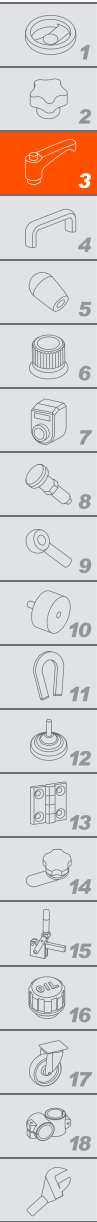
GN 927.2-A (d1)

Code	Description	d1	l1	l3	l4	l5	h	d3	d4	t	b	⚖
GN.67001	GN 927.2-44-M4-A-Z	M 4	44	13.2	2	2.2	0.5	12	15	8	12	30
GN.67031	GN 927.2-44-M5-A-Z	M 5	44	13.2	2	2.2	0.5	12	15	8	12	29
GN.67061	GN 927.2-63-M5-A-Z	M 5	63	16.3	2.5	3	0.75	16	19	10	16	66
GN.67091	GN 927.2-63-M6-A-Z	M 6	63	16.3	2.5	3	0.75	16	19	10	16	65
GN.67121	GN 927.2-82-M6-A-Z	M 6	82	19.5	3	3.7	1	20	25	12	20	131
GN.67151	GN 927.2-82-M8-A-Z	M 8	82	19.5	3	3.7	1	20	25	12	20	129
GN.67181	GN 927.2-101-M8-A-Z	M 8	101	25.3	4	4.8	1.5	26	30	15	25	253
GN.67211	GN 927.2-101-M10-A-Z	M 10	101	25.3	4	4.8	1.5	26	30	15	25	250

GN 927.2-B (d1)

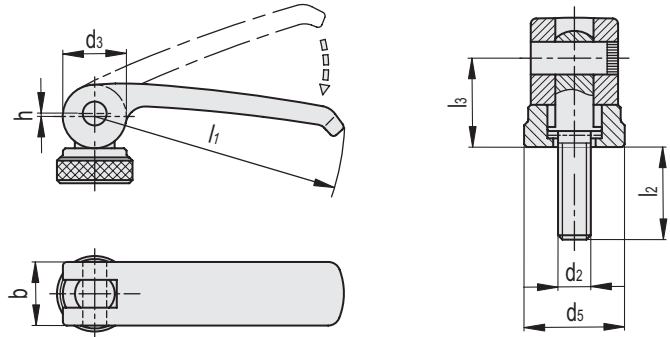
Code	Description	d1	l1	l3	l5	h	d3	d5	t	b	⚖
GN.67002	GN 927.2-44-M4-B-Z	M 4	44	13.2	2.2	0.5	12	14	8	12	28
GN.67032	GN 927.2-44-M5-B-Z	M 5	44	13.2	2.2	0.5	12	14	8	12	27
GN.67062	GN 927.2-63-M5-B-Z	M 5	63	16.3	3	0.75	16	18.5	10	16	64
GN.67092	GN 927.2-63-M6-B-Z	M 6	63	16.3	3	0.75	16	18.5	10	16	63
GN.67122	GN 927.2-82-M6-B-Z	M 6	82	19.5	3.7	1	20	22.5	12	20	124
GN.67152	GN 927.2-82-M8-B-Z	M 8	82	19.5	3.7	1	20	22.5	12	20	122
GN.67182	GN 927.2-101-M8-B-Z	M 8	101	25.3	4.8	1.5	26	27	15	25	238
GN.67212	GN 927.2-101-M10-B-Z	M 10	101	25.3	4.8	1.5	26	27	15	25	236





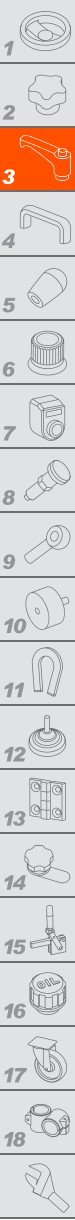
GN 927.2-A (d2 - l2)

Code	Description	l1	l2	d2	l3	l4	h	d3	d4	b	Δ
GN.67011	GN 927.2-44-M4-12-A-Z	44	12	M 4	13.2	2	0.5	12	15	12	32
GN.67013	GN 927.2-44-M4-16-A-Z	44	16	M 4	13.2	2	0.5	12	15	12	34
GN.67015	GN 927.2-44-M4-20-A-Z	44	20	M 4	13.2	2	0.5	12	15	12	36
GN.67017	GN 927.2-44-M4-25-A-Z	44	25	M 4	13.2	2	0.5	12	15	12	38
GN.67019	GN 927.2-44-M4-30-A-Z	44	30	M 4	13.2	2	0.5	12	15	12	40
GN.67041	GN 927.2-44-M5-12-A-Z	44	12	M 5	13.2	2	0.5	12	15	12	33
GN.67043	GN 927.2-44-M5-16-A-Z	44	16	M 5	13.2	2	0.5	12	15	12	35
GN.67045	GN 927.2-44-M5-20-A-Z	44	20	M 5	13.2	2	0.5	12	15	12	37
GN.67047	GN 927.2-44-M5-25-A-Z	44	25	M 5	13.2	2	0.5	12	15	12	39
GN.67049	GN 927.2-44-M5-30-A-Z	44	30	M 5	13.2	2	0.5	12	15	12	41
GN.67051	GN 927.2-44-M5-35-A-Z	44	35	M 5	13.2	2	0.5	12	15	12	43
GN.67053	GN 927.2-44-M5-40-A-Z	44	40	M 5	13.2	2	0.5	12	15	12	45
GN.67071	GN 927.2-63-M5-16-A-Z	63	16	M 5	16.3	2.5	0.75	16	19	16	70
GN.67073	GN 927.2-63-M5-20-A-Z	63	20	M 5	16.3	2.5	0.75	16	19	16	72
GN.67075	GN 927.2-63-M5-25-A-Z	63	25	M 5	16.3	2.5	0.75	16	19	16	74
GN.67077	GN 927.2-63-M5-30-A-Z	63	30	M 5	16.3	2.5	0.75	16	19	16	76
GN.67079	GN 927.2-63-M5-35-A-Z	63	35	M 5	16.3	2.5	0.75	16	19	16	78
GN.67081	GN 927.2-63-M5-40-A-Z	63	40	M 5	16.3	2.5	0.75	16	19	16	80
GN.67083	GN 927.2-63-M5-50-A-Z	63	50	M 5	16.3	2.5	0.75	16	19	16	82
GN.67101	GN 927.2-63-M6-16-A-Z	63	16	M 6	16.3	2.5	0.75	16	19	16	72
GN.67103	GN 927.2-63-M6-20-A-Z	63	20	M 6	16.3	2.5	0.75	16	19	16	74
GN.67105	GN 927.2-63-M6-25-A-Z	63	25	M 6	16.3	2.5	0.75	16	19	16	76
GN.67107	GN 927.2-63-M6-30-A-Z	63	30	M 6	16.3	2.5	0.75	16	19	16	78
GN.67109	GN 927.2-63-M6-35-A-Z	63	35	M 6	16.3	2.5	0.75	16	19	16	80
GN.67111	GN 927.2-63-M6-40-A-Z	63	40	M 6	16.3	2.5	0.75	16	19	16	82
GN.67113	GN 927.2-63-M6-50-A-Z	63	50	M 6	16.3	2.5	0.75	16	19	16	84
GN.67131	GN 927.2-82-M6-20-A-Z	82	20	M 6	19.5	3	1	20	25	20	137
GN.67133	GN 927.2-82-M6-25-A-Z	82	25	M 6	19.5	3	1	20	25	20	139
GN.67135	GN 927.2-82-M6-30-A-Z	82	30	M 6	19.5	3	1	20	25	20	141
GN.67137	GN 927.2-82-M6-35-A-Z	82	35	M 6	19.5	3	1	20	25	20	143
GN.67139	GN 927.2-82-M6-40-A-Z	82	40	M 6	19.5	3	1	20	25	20	145
GN.67141	GN 927.2-82-M6-50-A-Z	82	50	M 6	19.5	3	1	20	25	20	147
GN.67143	GN 927.2-82-M6-60-A-Z	82	60	M 6	19.5	3	1	20	25	20	149
GN.67161	GN 927.2-82-M8-20-A-Z	82	20	M 8	19.5	3	1	20	25	20	142
GN.67163	GN 927.2-82-M8-25-A-Z	82	25	M 8	19.5	3	1	20	25	20	144
GN.67165	GN 927.2-82-M8-30-A-Z	82	30	M 8	19.5	3	1	20	25	20	146
GN.67167	GN 927.2-82-M8-35-A-Z	82	35	M 8	19.5	3	1	20	25	20	148
GN.67169	GN 927.2-82-M8-40-A-Z	82	40	M 8	19.5	3	1	20	25	20	150
GN.67171	GN 927.2-82-M8-50-A-Z	82	50	M 8	19.5	3	1	20	25	20	152
GN.67173	GN 927.2-82-M8-60-A-Z	82	60	M 8	19.5	3	1	20	25	20	154
GN.67191	GN 927.2-101-M8-20-A-Z	101	20	M 8	25.3	4	1.5	26	30	25	266
GN.67193	GN 927.2-101-M8-25-A-Z	101	25	M 8	25.3	4	1.5	26	30	25	268
GN.67195	GN 927.2-101-M8-30-A-Z	101	30	M 8	25.3	4	1.5	26	30	25	270
GN.67197	GN 927.2-101-M8-35-A-Z	101	35	M 8	25.3	4	1.5	26	30	25	272
GN.67199	GN 927.2-101-M8-40-A-Z	101	40	M 8	25.3	4	1.5	26	30	25	274
GN.67201	GN 927.2-101-M8-50-A-Z	101	50	M 8	25.3	4	1.5	26	30	25	276
GN.67203	GN 927.2-101-M8-60-A-Z	101	60	M 8	25.3	4	1.5	26	30	25	278
GN.67221	GN 927.2-101-M10-20-A-Z	101	20	M 10	25.3	4	1.5	26	30	25	270
GN.67223	GN 927.2-101-M10-25-A-Z	101	25	M 10	25.3	4	1.5	26	30	25	272
GN.67225	GN 927.2-101-M10-30-A-Z	101	30	M 10	25.3	4	1.5	26	30	25	274
GN.67227	GN 927.2-101-M10-35-A-Z	101	35	M 10	25.3	4	1.5	26	30	25	276
GN.67229	GN 927.2-101-M10-40-A-Z	101	40	M 10	25.3	4	1.5	26	30	25	278
GN.67231	GN 927.2-101-M10-50-A-Z	101	50	M 10	25.3	4	1.5	26	30	25	280
GN.67233	GN 927.2-101-M10-60-A-Z	101	60	M 10	25.3	4	1.5	26	30	25	282



GN 927.2-B (d2 - l2)

Code	Description	l1	l2	d2	l3	h	d3	d5	b	⚖
GN.67012	GN 927.2-44-M4-12-B-Z	44	12	M 4	13.2	0.5	12	14	12	30
GN.67014	GN 927.2-44-M4-16-B-Z	44	16	M 4	13.2	0.5	12	14	12	32
GN.67016	GN 927.2-44-M4-20-B-Z	44	20	M 4	13.2	0.5	12	14	12	34
GN.67018	GN 927.2-44-M4-25-B-Z	44	25	M 4	13.2	0.5	12	14	12	36
GN.67020	GN 927.2-44-M4-30-B-Z	44	30	M 4	13.2	0.5	12	14	12	38
GN.67042	GN 927.2-44-M5-12-B-Z	44	12	M 5	13.2	0.5	12	14	12	31
GN.67044	GN 927.2-44-M5-16-B-Z	44	16	M 5	13.2	0.5	12	14	12	33
GN.67046	GN 927.2-44-M5-20-B-Z	44	20	M 5	13.2	0.5	12	14	12	35
GN.67048	GN 927.2-44-M5-25-B-Z	44	25	M 5	13.2	0.5	12	14	12	37
GN.67050	GN 927.2-44-M5-30-B-Z	44	30	M 5	13.2	0.5	12	14	12	39
GN.67052	GN 927.2-44-M5-35-B-Z	44	35	M 5	13.2	0.5	12	14	12	41
GN.67054	GN 927.2-44-M5-40-B-Z	44	40	M 5	13.2	0.5	16	14	12	43
GN.67072	GN 927.2-63-M5-16-B-Z	63	16	M 5	16.3	0.75	16	18.5	16	68
GN.67074	GN 927.2-63-M5-20-B-Z	63	20	M 5	16.3	0.75	16	18.5	16	70
GN.67076	GN 927.2-63-M5-25-B-Z	63	25	M 5	16.3	0.75	16	18.5	16	72
GN.67078	GN 927.2-63-M5-30-B-Z	63	30	M 5	16.3	0.75	16	18.5	16	74
GN.67080	GN 927.2-63-M5-35-B-Z	63	35	M 5	16.3	0.75	16	18.5	16	76
GN.67082	GN 927.2-63-M5-40-B-Z	63	40	M 5	16.3	0.75	16	18.5	16	78
GN.67084	GN 927.2-63-M5-50-B-Z	63	50	M 5	16.3	0.75	16	18.5	16	80
GN.67102	GN 927.2-63-M6-16-B-Z	63	16	M 6	16.3	0.75	16	18.5	16	70
GN.67104	GN 927.2-63-M6-20-B-Z	63	20	M 6	16.3	0.75	16	18.5	16	72
GN.67106	GN 927.2-63-M6-25-B-Z	63	25	M 6	16.3	0.75	16	18.5	16	74
GN.67108	GN 927.2-63-M6-30-B-Z	63	30	M 6	16.3	0.75	16	18.5	16	76
GN.67110	GN 927.2-63-M6-35-B-Z	63	35	M 6	16.3	0.75	16	18.5	16	78
GN.67112	GN 927.2-63-M6-40-B-Z	63	40	M 6	16.3	0.75	16	18.5	16	80
GN.67114	GN 927.2-63-M6-50-B-Z	63	50	M 6	16.3	0.75	16	18.5	16	82
GN.67132	GN 927.2-82-M6-20-B-Z	82	20	M 6	19.5	1	20	22.5	20	130
GN.67134	GN 927.2-82-M6-25-B-Z	82	25	M 6	19.5	1	20	22.5	20	132
GN.67136	GN 927.2-82-M6-30-B-Z	82	30	M 6	19.5	1	20	22.5	20	134
GN.67138	GN 927.2-82-M6-35-B-Z	82	35	M 6	19.5	1	20	22.5	20	136
GN.67140	GN 927.2-82-M6-40-B-Z	82	40	M 6	19.5	1	20	22.5	20	138
GN.67142	GN 927.2-82-M6-50-B-Z	82	50	M 6	19.5	1	20	22.5	20	140
GN.67144	GN 927.2-82-M6-60-B-Z	82	60	M 6	19.5	1	20	22.5	20	135
GN.67162	GN 927.2-82-M8-20-B-Z	82	20	M 8	19.5	1	20	22.5	20	137
GN.67164	GN 927.2-82-M8-25-B-Z	82	25	M 8	19.5	1	20	22.5	20	139
GN.67166	GN 927.2-82-M8-30-B-Z	82	30	M 8	19.5	1	20	22.5	20	141
GN.67168	GN 927.2-82-M8-35-B-Z	82	35	M 8	19.5	1	20	22.5	20	143
GN.67170	GN 927.2-82-M8-40-B-Z	82	40	M 8	19.5	1	20	22.5	20	145
GN.67172	GN 927.2-82-M8-50-B-Z	82	50	M 8	19.5	1	20	22.5	20	147
GN.67174	GN 927.2-82-M8-60-B-Z	82	60	M 8	19.5	1	20	22.5	20	149
GN.67192	GN 927.2-101-M8-20-B-Z	101	20	M 8	25.3	1.5	26	27	25	251
GN.67194	GN 927.2-101-M8-25-B-Z	101	25	M 8	25.3	1.5	26	27	25	253
GN.67196	GN 927.2-101-M8-30-B-Z	101	30	M 8	25.3	1.5	26	27	25	255
GN.67198	GN 927.2-101-M8-35-B-Z	101	35	M 8	25.3	1.5	26	27	25	257
GN.67200	GN 927.2-101-M8-40-B-Z	101	40	M 8	25.3	1.5	26	27	25	259
GN.67202	GN 927.2-101-M8-50-B-Z	101	50	M 8	25.3	1.5	26	27	25	261
GN.67204	GN 927.2-101-M8-60-B-Z	101	60	M 8	25.3	1.5	26	27	25	263
GN.67222	GN 927.2-101-M10-20-B-Z	101	20	M 10	25.3	1.5	26	27	25	255
GN.67224	GN 927.2-101-M10-25-B-Z	101	25	M 10	25.3	1.5	26	27	25	257
GN.67226	GN 927.2-101-M10-30-B-Z	101	30	M 10	25.3	1.5	26	27	25	259
GN.67228	GN 927.2-101-M10-35-B-Z	101	35	M 10	25.3	1.5	26	27	25	261
GN.67230	GN 927.2-101-M10-40-B-Z	101	40	M 10	25.3	1.5	26	27	25	263
GN.67232	GN 927.2-101-M10-50-B-Z	101	50	M 10	25.3	1.5	26	27	25	265
GN.67234	GN 927.2-101-M10-60-B-Z	101	60	M 10	25.3	1.5	26	27	25	267



Clamping handles

CLAMPING AND MANUAL FORCES IN CLAMPING LEVERS WITH ECCENTRIC CAM

The eccentric principle has two advantages: A large clamping force F_s and a self-locking mechanism as soon as the dead centre is exceeded. All theoretical attempts to describe the ratio between manual and clamping force will ultimately rest only on assumptions in some parameters. The actually prevailing conditions are influenced by a number of different factors.

The values given in the tables below are therefore based on practical specifications and findings and rest on test series which have shown which clamping forces can be achieved by applying the specified manual forces.

The maximum permitted pretensioning force of each thread size will not be exceeded by operating the lever.

CALCULATION

To account for the above theoretical and arithmetical alternative for determining clamping and manual forces, a potential solution will be shown below which will ultimately also prove the plausibility of the values given in the table using a calculation example.

When theoretically determining the clamping force F_s resulting from the manual force, two points must be observed in particular:

First, there are the geometrical conditions existing at the eccentric which call for an arithmetically complex approach if one wishes to take account of the exact conditions. Secondly, the friction occurring at several points will have a strong impact on the achievable clamping force.

1ST ALTERNATIVE, ECCENTRIC

Looking at the developed view arising in an eccentric through the rolling motion, one will find that this is caused by a sinusoidal curve.

The result is that the gradient angle w above the swivel range changes permanently, causing an extension of the self-locking range and of the force transmission.

However, the arithmetical description of this approach is highly complex.

SUBSTITUTE CALCULATION MODEL

In simple terms and assuming a constant gradient, the existing sine curve may be seen as a wedge which will result in a sufficiently accurate and approximate substitute calculation model which is a great deal less complex.

A friction value will be assumed for the axis of rotation and the circumference of the eccentric, which will in reality be strongly influenced by external factors and may therefore diverge accordingly.

2ND ALTERNATIVE, ECCENTRIC

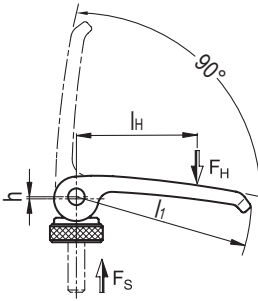
A 90° motion of the manual lever covers the stroke h .

SAFETY NOTICES

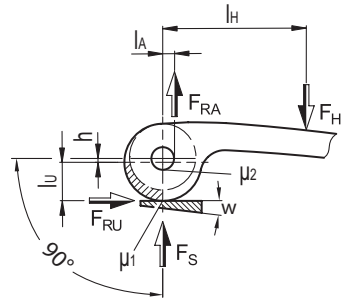
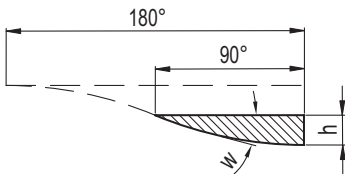
The design of applications involving clamping levers with eccentric cam should always be made including an adequate safety factor. Usual safety factors for static loads 1,2 to 1,5; pulsating 1,8 to 2,4 and alternating 3 to 4. To be increased proportionally in applications with higher safety requirements.

DISCLAIMER:

The information and recommendations we give are made without commitment and excluding any liability, unless we have committed ourselves expressly and in writing to give such information and recommendations. All products are standard parts designed for a variety of different uses and have as such been subjected to extensive standard tests; users should determine in their own test series, for which we will not be liable, whether a product will be suitable for certain special applications and uses.



l1	≈ FH	≈ lH	≈ FS
Lever size	Manual force in N	Lever, manual force	Screw force / Clamping force in N
44	75	33	1450
63	125	47	2600
82	200	62	4300
101	350	76	7000



F_s	Screw force / clamping force (resulting)
F_H	Manual force
l_H	Lever arm of the manual force
F_{RU}	Friction force at circumf.
l_U	Lever arm at circumference
F_{RA}	Friction force at the axis
l_A	Lever arm at the axis
w	Substitute wedge angle
h	Stroke at 90° rotation of the lever
μ_1	Friction coefficient at circumf.
μ_2	Friction coefficient at the axis

Clamping force	Friction coefficient (wedge angle, ¼ circle)
$F_s = F_H \times l_H / ((l_U \times (\mu_w + \mu_1)) + (l_A \times \mu_2))$	$\mu_w = h \times 4 / \pi \times 2 \times l_U$

Example		
Clamping lever with eccentric cam GN 927.2-101-M8-B		
with manual force $F_H = 350$ N, friction coefficient $\mu_1 = 0,2$ and $\mu_2 = 0,1$ plus lever arm $l_A = 5$ mm and $l_U = 11,5$ mm		
$F_s = 350 \text{ N} \times 76 \text{ mm} / ((11,5 \text{ mm} \times (0,083 + 0,2)) + (5 \text{ mm} \times 0,1)) = 7000 \text{ N}$		
The following friction coefficients μ may be used for potential friction pairings:		
Plastic / Plastic ≈ 0,25	Steel / Steel (lubricated) ≈ 0,1	Steel / Steel ≈ 0,2
Plastic / Steel ≈ 0,15	Stainless Steel / Stainless Steel (lubricated) ≈ 0,1	Stainless Steel / Stainless Steel ≈ 0,2