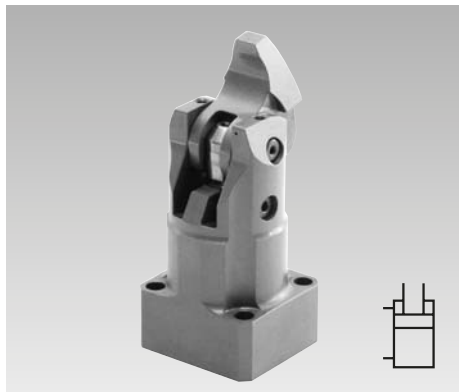




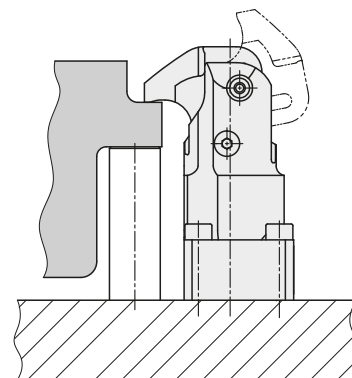
Compact Clamps

Manifold-mounting type, pneumatic clamping monitoring optional, double acting, max. operating pressure 250 bar



Advantages

- Minimum dimensions
- Mounting without pipes
- Metallic wiper edge for piston rod
- Clamping lever can be swivelled into small recesses
- Workpiece clamping without any side loads
- Unimpeded loading and unloading of the clamping fixture
- Long clamping lever adaptable to the workpiece
- Mounting position: any



Application

Compact clamps are designed for application in hydraulic clamping fixtures where oil supply is effected through drilled channels in the fixture body.

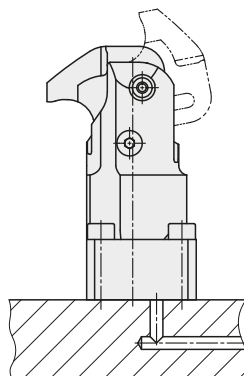
Due to the minimum space required the compact clamp is especially suitable for clamping fixtures with little space for the installation of hydraulic clamping elements.

A clamping recess in the workpiece a little bit wider than the clamping lever is sufficient as clamping surface. Typical applications are:

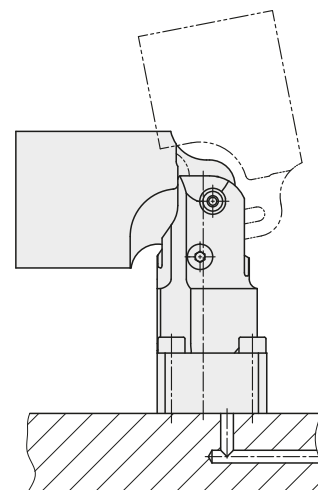
- Rotary indexing fixtures in horizontal and vertical machining centres
- Clamping fixtures for machining of several sides and complete machining
- Multiple clamping fixtures with many workpieces that are closely arranged
- Test systems for motors, gears, etc.
- Assembly lines

Installation and connecting possibilities

Drilled channels with short clamping lever



with long clamping lever (blank)



Description

The hydraulic compact clamp is a double-acting pull-type cylinder where a part of the linear stroke is used to swing the clamping lever onto the workpiece.

Available versions

1. With pneumatic clamping monitoring 180X-XXX

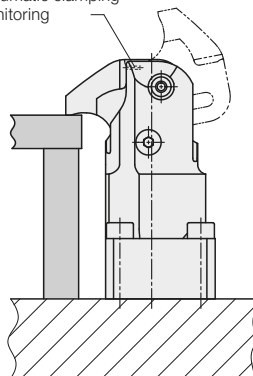
The clamping monitoring signals.

“The clamping lever is within the usable clamping range and the workpiece is clamped with minimum clamping force (min. 70 bar).”

2. Without clamping monitoring 180X-XXXB

Pneumatic clamping monitoring

Bore hole for pneumatic clamping monitoring



Application example



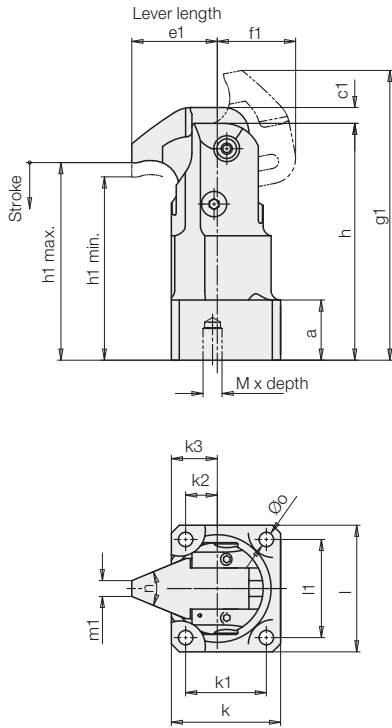
Clamping of a cast part with special clamping lever

Important notes

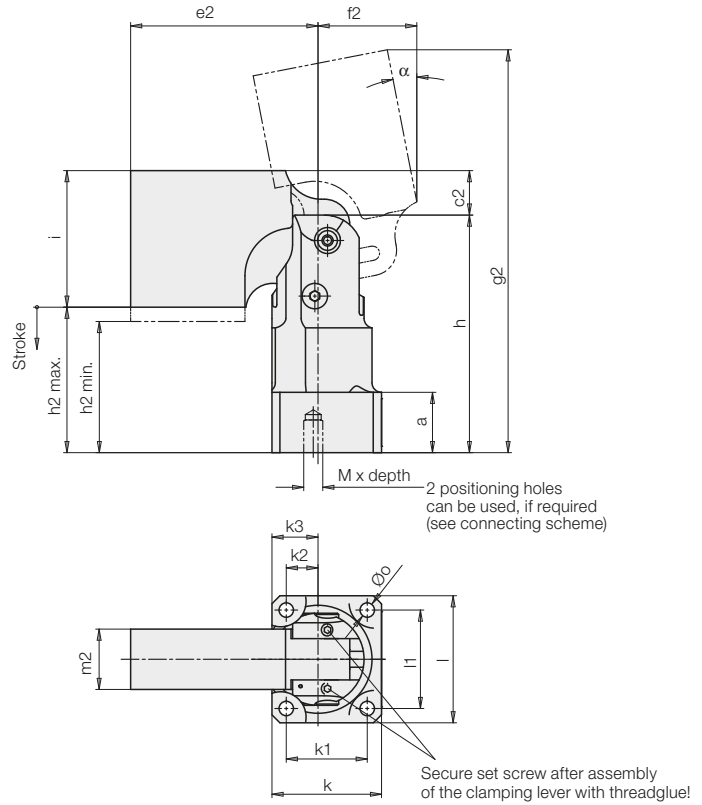
(see page 3)

Dimensions

With cover Short clamping lever

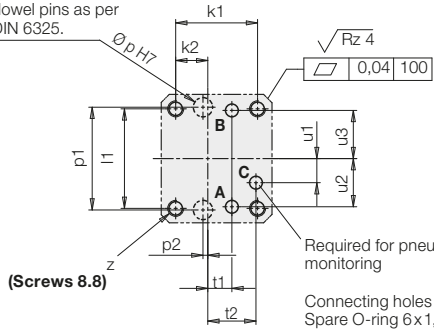


Long clamping lever (blank)



Connecting scheme

Only required if the compact clamp shall be positioned with dowel pins as per DIN 6325.



- A** = Clamping
- B** = Unclamping
- C** = Clamping monitoring

Required for pneumatic clamping monitoring

Connecting holes max. Ø4
Spare O-ring 6 x 1,5
Part no. 3000-313

Material

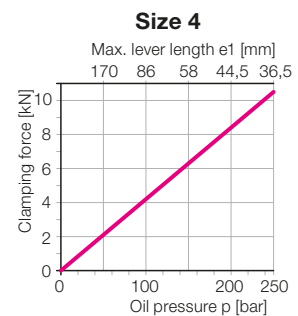
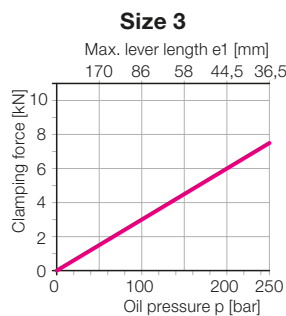
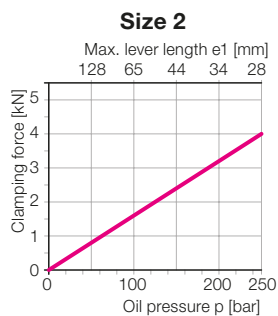
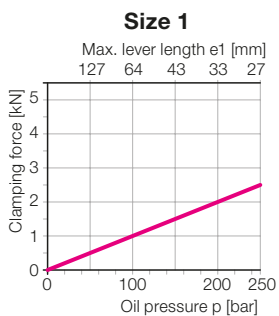
Housing: hardened, stainless

Clamping lever:
short HRc 48 – 55, stainless
long (blank) X37CrMo V5-1 hardened and tempered
HRc 40 and nitrated

Seals: NBR and PUR (max. 80°)

Pneumatic clamping monitoring see page 4

Effective clamping force and max. lever length e1 as a function of the operating pressure p



Technical data Dimensions

Size		1	2	3	4
Clamping force at 250 bar and short clamping lever	[kN]	2.5	4.0	7.5	10.5
Max. stroke	[mm]	5	5	7.5	9
Clamping stroke, useable	[mm]	4.5	4.5	7	8.5
Piston Ø	[mm]	18	22	28	33
Rod Ø	[mm]	11	14	17	19
Oil volume clamping	[cm ³]	0.8	1.2	2.4	5.2
Oil volume unclamping	[cm ³]	1.3	1.9	3.8	7.8
Max. flow rate	[cm ³ /s]	4	5.5	11	25
Min. operating pressure without clamping monitoring	[bar]	20	20	20	20
with clamping monitoring	[bar]	70	70	70	70
Min. air pressure	[bar]	4	4	4	4
α	[°]	11	10	15	15
a	[mm]	19	21	24	24
c1	[mm]	5	5	7.5	9
c2	[mm]	14	12	7.5	9
e1	[mm]	27	28	36.5	36.5
e2	[mm]	59	60	67.5	67.5
f1	[mm]	25	26	32	35
f2	[mm]	32	31	32	35
g1 min./max.*	[mm]	91.5/92.1	95.1/95.4	115.7	118.2
g2 min./max.*	[mm]	126.8/129.8	130.5/133.8	151.1/152	154.4/155.5
h	[mm]	74.8	80.8	95.4	98.6
h1 max.	[mm]	62.3	64.3	74.9	76.6
h1 min.	[mm]	57.3	59.3	67.4	67.6
h2 max.	[mm]	45.8	46.8	58.4	60.1
h2 min.	[mm]	40.8	41.8	50.9	51.1
i	[mm]	43	46	44.5	47.5
k	[mm]	34.5	41.5	52	54
k1	[mm]	25.5	31.5	38	41
k2	[mm]	10	14	16	18
k3	[mm]	14.5	19	23	24.5
l	[mm]	40	45	58	59
l1	[mm]	31	35	44	46
m1	[mm]	5	6	8	8
m2	[mm]	19	24	32	35
n	[°]	45	56	56	62
Ø o	[mm]	5.2	6.2	8.2	8.2
Ø p H7	[mm]	6	6	8	8
p1 ±0.01	[mm]	32	35	44	48
p2	[mm]	1.5	0	0	3
Ø q x depth	[mm]	6.2 x 10	6.2 x 10	8.2 x 18	8.2 x 18
t1	[mm]	7.5	8.5	10	11
t2	[mm]	15	16.7	21.5	21.2
u1	[mm]	7.5	9.2	12.5	13
u2	[mm]	15	16.8	20	23
u3	[mm]	15	16.8	20	22
z	[mm]	M5	M6	M8	M8

With pneumatic clamping monitoring

Part no. - Short clamping lever	1801-210	1802-210	1803-210	1804-210
Weight, approx. [kg]	0.46	0.69	1.29	1.42
Part no. - Long clamping lever (blank)	1801-230	1802-230	1803-230	1804-230
Weight, approx. [kg]	0.74	1.05	1.77	1.93

Without clamping monitoring

Part no. (version see above)	1801-2XXB	1802-2XXB	1803-2XXB	1804-2XXB
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Accessories

Part no. - Short clamping lever	3548-1121	3548-1122	3548-1123	3548-1124
Part no. - Long clamping lever (blank)	3548-1071	3548-1072	3548-1073	3548-1074

* min. = height in unclamping position as presented. max. = max. height for swing in

Important notes!

Compact clamps must only be used for clamping of workpieces in industrial applications and may only be operated with hydraulic oil. Hydraulic clamping elements can generate considerable forces. The workpiece, the fixture or the machine must be in the position to compensate these forces.

In the effective area of the piston rod and the clamping arm there is the danger of crushing. The manufacturer of the fixture or the machine

is obliged to provide effective protection devices. During loading and unloading of the fixture and during clamping a collision with the clamping arm has to be avoided.

Remedy: Mount position adaptor.

Due to the relatively small clamping stroke the height of the manifold surface of the compact clamp should be adapted to the workpiece height so that the clamping point is approximately in the centre of the usa-

ble clamping stroke.

By doing so a sufficient reserve remains also in the case of larger workpiece tolerances. The compact clamp has to be checked regularly on contamination by swarf and has to be cleaned, if required. In the case of increased swarf formation, the compact clamp must be included into the cleaning process with coolant. Operating conditions, tolerances and other data see data sheet A 0.100 and A 0.130.

Pneumatic clamping monitoring

In the clamping area, the clamping lever slides downwards at two hardened surfaces of the body. In one of the surfaces there is the bore hole for the pneumatic clamping monitoring. The clamping lever overruns the bore hole, but does not completely close it. Only when the workpiece is really clamped, the clamping lever supports itself on the sliding surface and the bore hole will be firmly closed.

The clamping monitoring signals.

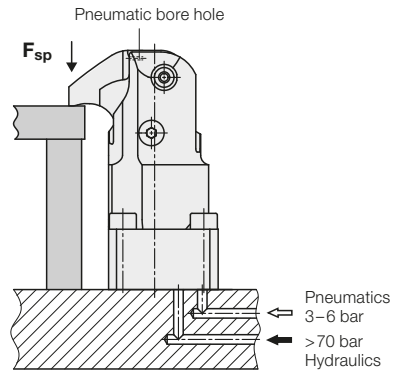
- The clamping lever is in the usable clamping range and
- a workpiece is clamped.

Important note

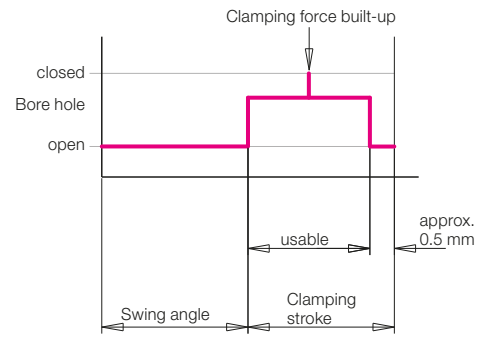
Required minimum pressures for clamping monitoring:

- Hydraulics 70 bar
- Pneumatics 3 bar

Clamping monitoring



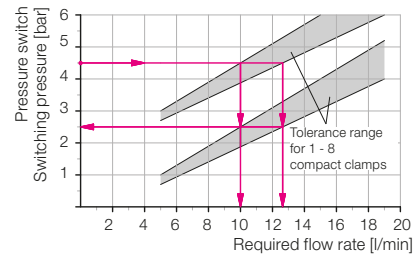
Function chart



Example for clamping position

Required switching pressure 4.5 bar
 Pressure drop, if 1 compact clamp is not clamped approx. 2 bar

As per diagram:
 Required flow rate approx. 10-13 l/min
 (depending on the number of connected compact clamps)



Required flow rate depending on the switching pressure of the pneumatic pressure switch for a pressure drop Δp 2 bar

Monitoring by pneumatic pressure switch

For the evaluation of the pneumatic pressure increase standard pneumatic pressure switches can be used.

With one pressure switch up to 8 compact clamps can be controlled.

Important note

Pneumatic position monitorings are only process-safe, when air pressure and air volume are precisely adjusted.

For measuring of the air volume appropriate devices are available. Please contact us.

