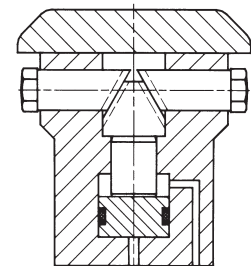
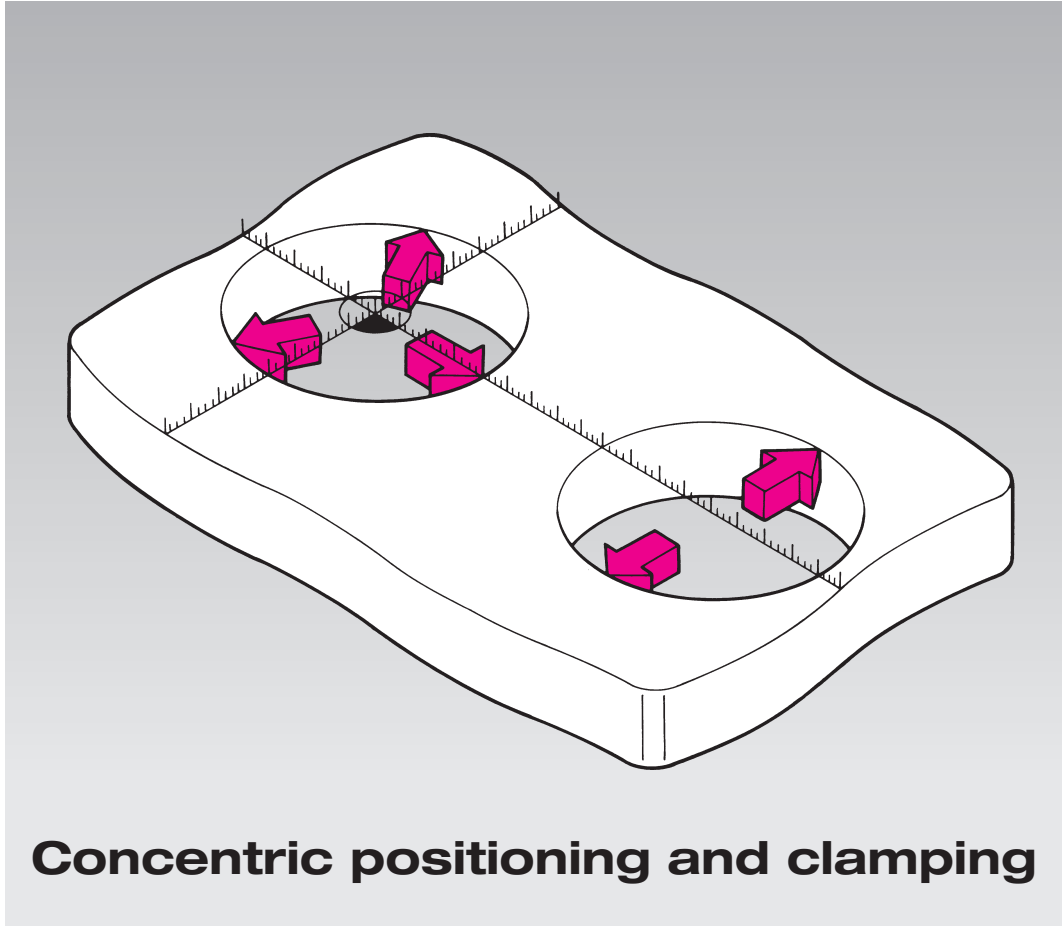




Concentric Positioning and Clamping Elements

2 and 3-point positioning, double acting, hydraulically operated
 max. operating pressure 250 bar

Diameters from 25 mm to 177 mm



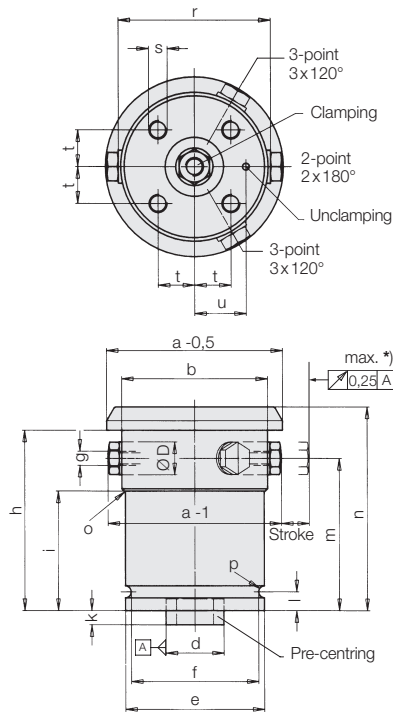
2 and 3-point concentric positioning and clamping elements



Version 431200X, -02X, -05X, -07X



Version 43121XX, -2XX, -3XX, -4XX



Clamping Ø a	Part no. 2-point elements	Part no. 3-point elements
25 – 29	4312000	4312025
28 – 32	001	026
32 – 36	002	027
36 – 40	4312050	4312075
39 – 43	051	076
42 – 46	052	077
45 – 49	053	078
48 – 52	054	079
51 – 55	055	080
54 – 59	4312100	4312150
58 – 63	101	151
62 – 67	102	152
67 – 72	103	153
71 – 76	104	154
76 – 84	4312200	4312250
83 – 91	201	251
90 – 98	202	252
98 – 109	4312300	4312350
109 – 120	301	351
119 – 130	302	352
130 – 145	4312400	4312450
141 – 156	401	451
152 – 167	402	452
163 – 177	403	453

Description

Workpieces with cast or machined bores, reliefs or break-outs, can be easily loaded to the fixture with the concentric positioning and clamping elements and concentrically clamped or positioned for machining. Overtolerance conditions can be avoided and clamping tasks can be completely solved by an ingenious combination of 2 and 3-point elements. Various mounting and connecting possibilities extend the use for multiple applications. Different sizes and correspondingly adapted contact bolts allow exact adaptation to the required clamping diameter.

Important notes

The pre-centring with the supplied bushing (Ød) allows a positioning precision of max. 0.125 mm. The values for positioning and repetitive accuracy specified in the chart can only be obtained by determining the virtual NOMINAL position (zero point). Both options are also shown visually on page 4. The prerequisites and the influence of the workpiece weight on the positioning accuracy are also described. These concentric clamping elements are not only suitable for the use on lathes.

Elements for clamping diameters bigger than Ø 177 mm are available on request.

	431200X 431202X	431205X 431207X	43121XX	43122XX	43123XX	43124XX
Clamping range Ø	[mm] 25–36	36–55	54–76	76–98	98–130	130–177
Clamping force at 100 bar	[kN] 4	4	3	7	11	17
at 250 bar	[kN] 10	10	7	17	28	44
Adm. positioning force at a minimum pressure of 100 bar (see page 4)	[kN] 1.6	1.6	1.1	2.7	4.5	7.0
Positioning accuracy*	[mm] 0.02	0.02	0.02	0.025	0.025	0.03
Repetitive accuracy *	[mm] 0.04	0.04	0.04	0.05	0.05	0.06
Minimum operating pressure	[bar] 20	20	20	20	20	20
Max. operating pressure	[bar] 250	250	250	250	250	250
Oil volume / mm advance stroke	[cm ³] 0.35	0.35	0.35	0.85	1.39	2.17
/ mm return stroke	[cm ³] 0.15	0.15	0.15	0.50	0.84	1.33
Tightening torque - contact bolt	[Nm] –	15	10	10	15	20
Bolt Ø D	[mm] 14	14	12	14	18	22
Stroke	[mm] 2.5	2.5	3	4.5	6	8
Ø b	[mm] 24	35	45	65	85	115
Ø d j 6	[mm] 16	16	16	25	32	40
Ø e –0.1	[mm] 45	45	45	60	74	90
Ø f –0.1	[mm] 40	40	40	54	67	81
g x depth of thread	[mm] –	M 8 x 6	M 6 x 8	M 6 x 12	M 8 x 16	M 10 x 20
h	[mm] 64	64	57	68	80	91
i	[mm] 28	28	–	41	47	52
k	[mm] 6	6	6	6	6	7
l	[mm] 8	8	8	9	10	12
m	[mm] 51	51	45	56	64	72
n	[mm] 66.5	72	65	77	91	105
o	[mm] R 6	R 6	–	R 0.5	R 2.5	R 2.5
p	[mm] 2.6	2.6	2.6	3.1	3.6	4.6
r	[mm] –	29	45	65	85	115
s x depth of thread	[mm] M 6 x 12	M 6 x 12	M 6 x 12	M 8 x 16	M 10 x 20	M 12 x 24
t	[mm] 11.3	11.3	11.3	15.6	19.1	23.3
u	[mm] 16.8	16.8	16.8	22	27	33
Weight	[kg] 0.5	0.7	1.1	1.8	3.6	7.2

* see "Important notes" and the explanation on page 4

Mounting possibilities with accessory

Order information

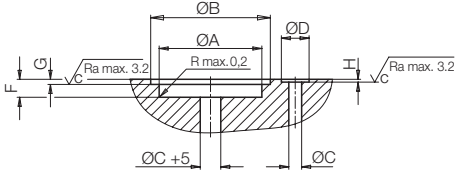
The elements except (4312 000/-025) are supplied with short, dome-head and hardened contact bolts as standard.

Please indicate on your order the corresponding workpiece diameter as well as the tolerances.

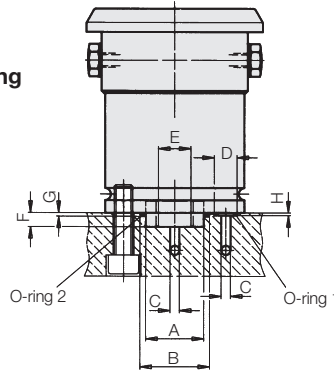
Clamping examples

see page 4.

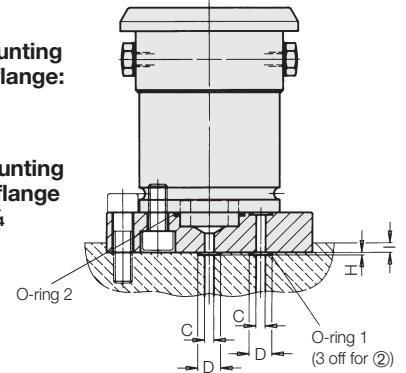
Centring and sealing for direct mounting, mounting by segments and mounting by ball nut



① **Direct mounting**

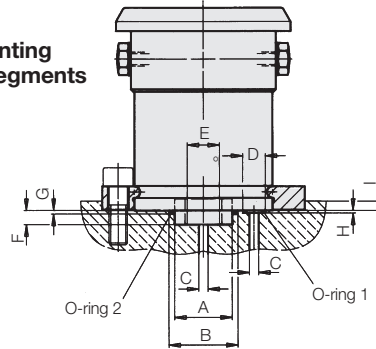


② **Mounting by flange:**

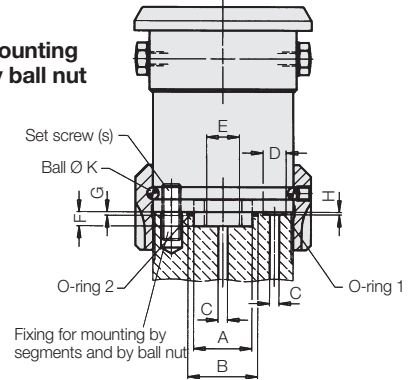


③ **Mounting by flange G ¼**

④ **Mounting by segments**

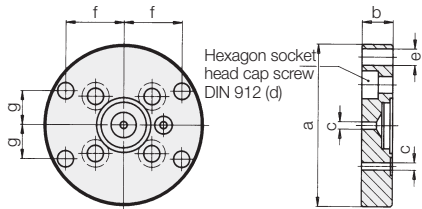


⑤ **Mounting by ball nut**



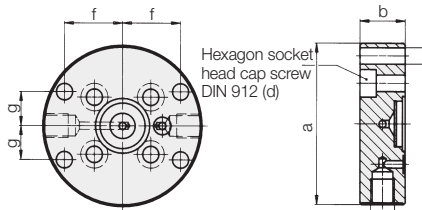
O-rings for mounting variants ① ② ③ ④ ⑤ (not included in the delivery)

for elements	A H7	B +0,2	C	D +0,2	E	F -0,1	G ±0,05	H ±0,05	K	I	O-ring 1	Part no.	O-ring 2	Part no.
43120XX	16	20.6	3	7.8	8	6	1.3	1.1	5	4	5 x 1.5	3000340	17.17 x 1.78	3000663
43121XX	16	20.6	3	7.8	8	6	1.3	1.1	5	4	5 x 1.5	3000340	17.17 x 1.78	3000663
43122XX	25	30.0	4	9.8	14	6	1.5	1.1	6	4	7 x 1.5	3000342	26.00 x 2.00	3000769
43123XX	32	36.6	5	10.8	16	6	1.3	1.1	7	4	8 x 1.5	3000343	33.05 x 1.78	3001238
43124XX	40	46.6	5	10.8	18	7	2.0	1.1	9	4	8 x 1.5	3000343	40.95 x 2.62	3000944



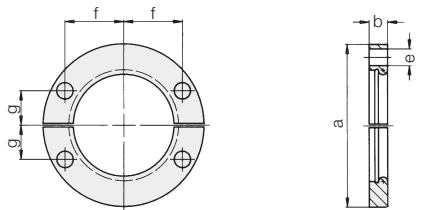
Mounting by flange ②

for elements	a h7	b	c	d	e	f	g	Part no.
43120XX	68	15	3	M 6 x 16	Ø 6.6	24.2	14.0	3456033
43121XX	68	15	3	M 6 x 16	Ø 6.6	24.2	14.0	3456033
43122XX	88	17	4	M 8 x 20	Ø 9.0	32.0	18.5	3456035
43123XX	110	20	5	M 10 x 25	Ø 11.0	39.8	23.0	3456037
43124XX	130	22	5	M 12 x 25	Ø 13.5	47.6	27.5	3456038



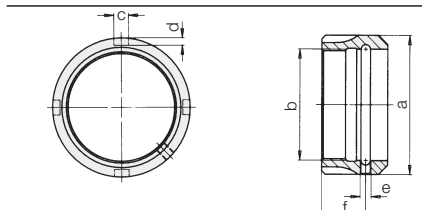
Mounting by flange G ¼ ③

for elements	a h7	b	c	d	e	f	g	Part no.
43120XX	68	30	G ¼	M 6 x 35	Ø 6.6	24.2	14.0	3456042
43121XX	68	30	G ¼	M 6 x 35	Ø 6.6	24.2	14.0	3456042
43122XX	88	30	G ¼	M 8 x 35	Ø 9.0	32.0	18.5	3456043
43123XX	110	30	G ¼	M 10 x 35	Ø 11.0	39.8	23.0	3456044
43124XX	130	30	G ¼	M 12 x 35	Ø 13.5	47.6	27.5	3456045



Mounting by segments ④

for elements	a	b	e	f	g	Part no.
43120XX	68	10.1	Ø 6.6	24.2	14.0	3533240
43121XX	68	10.1	Ø 6.6	24.2	14.0	3533240
43122XX	88	11.6	Ø 9.0	32.0	18.5	3533241
43123XX	110	13.1	Ø 11.0	39.8	23.0	3533242
43124XX	130	16.1	Ø 13.5	47.6	27.5	3533243



Mounting by ball nut (with balls and set screws) ⑤

for elements	a	b	c	d	e	f	Part no.
43120XX	63	M 48 x 1.5	8	3.5	M 6	22	0352762
43121XX	63	M 48 x 1.5	8	3.5	M 6	22	0352762
43122XX	78	M 60 x 1.5	8	3.5	M 8	25	0352763
43123XX	94	M 75 x 2.0	10	4.0	M 10	27	0352765

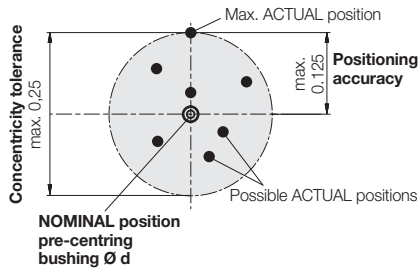
Positioning accuracy Clamping examples

Definition

The **positioning accuracy** is the deviation of the ACTUAL position from the NOMINAL position. The **repetitive accuracy** indicates the range of the reached position when a NOMINAL position is repeatedly approached from the same starting position.

1. Pre-centring with bushing $\varnothing d$

Due to component tolerances, the contact bolts have a concentricity tolerance of max. 0.25 mm (see dimensional drawing on page 2). If a workpiece is centred and clamped, the positioning accuracy is 0.125 mm (see sketch) in the worst case.



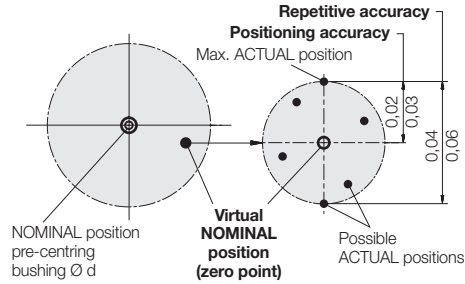
If further workpieces are inserted and clamped in the same way, the position accuracy will reach approximately the same value again.

2. Determine the virtual NOMINAL position

2.1 Centre and clamp a workpiece (sample part). This must be done in the same way as later in production.

2.2 Use the measuring probe to scan the clamped hole and determine the virtual zero point (hole centre).

2.3 Program the machine control accordingly. The advantage of this method is that a high positioning accuracy (0.02 - 0.03 mm) and repetitive accuracy (0.04 - 0.06 mm) can be expected (see chart on page 2).



3. Requirements

To ensure that all other similar workpieces in a series have the same virtual zero point, the following criteria must be met:

- The workpieces must always be moved from the same starting position and in the same way into the clamping position.

- The centring bore should be absolutely cylindrical.
- The centring bore should not have a concentricity error to the NOMINAL position.

4. Influence of the workpiece weight

High workpiece weights reduce the positioning accuracy and increase the wear of the centring bolts since

- in the case of vertical installation, the centring element has to apply the friction force that can be up to 25% of the workpiece weight.
- in the case of horizontal installation, the centring element must lift the workpiece a little.

5. Admissible positioning force

For the cases mentioned above, we have indicated an admissible positioning force in the chart on page 2. The corresponding workpiece weights are mechanically tolerable.

To enable the position accuracy according to the chart page 2, it is necessary to

- determine the virtual NOMINAL position according to point 2
- meet the requirements according to point 3.

6. Clamping examples

A number of examples where the weight of the workpieces is negligible can be found on this page.

