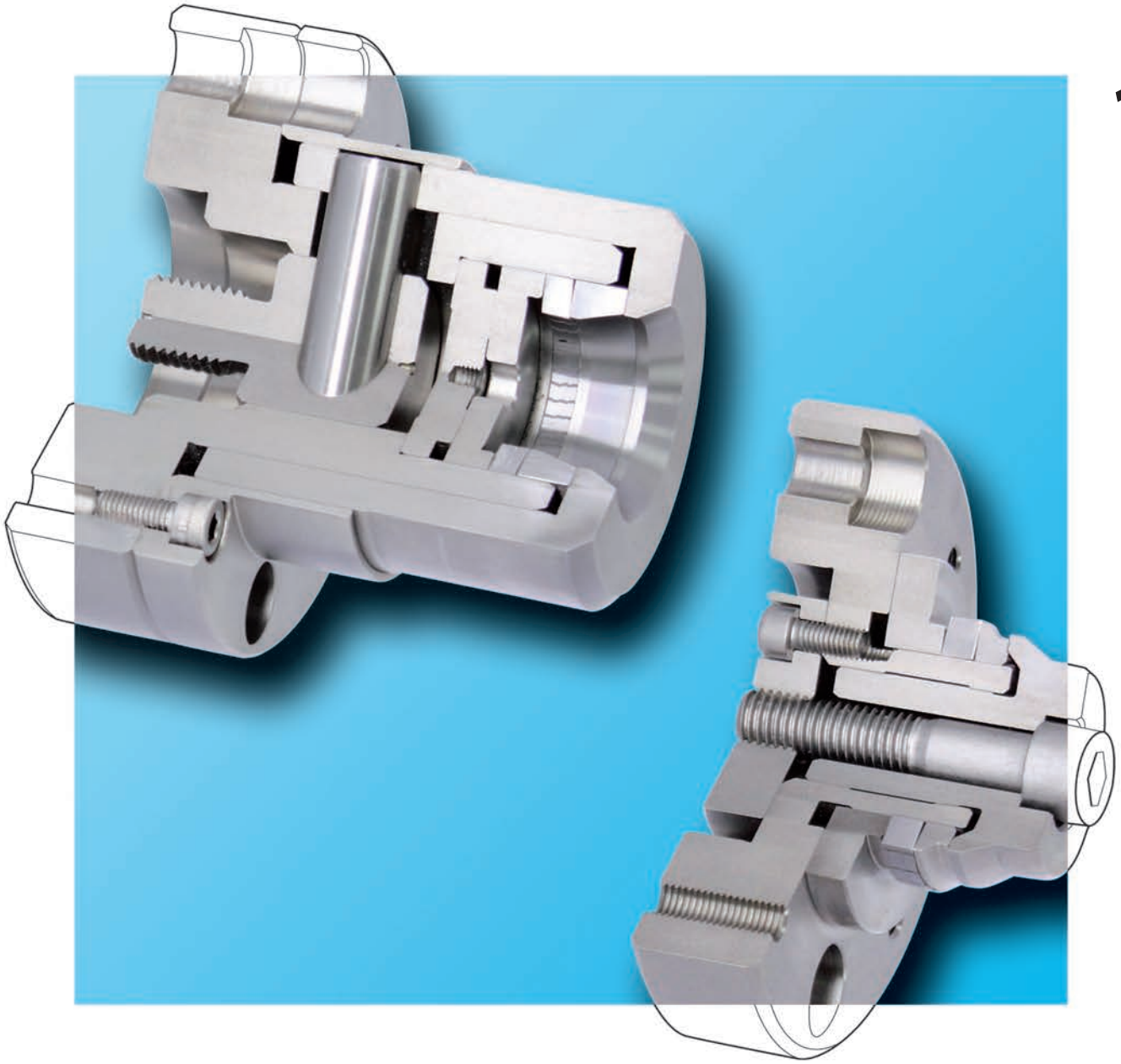
RINGSPANN®
Workholding Technology

Precision Clamping Fixtures

Precision Clamping Chucks • Precision Clamping Mandrels • Clamping Clutches



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Edition 2014/2015

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Issue 09/2014 - Technical details subject to change without notice.

The RINGSPANN idea

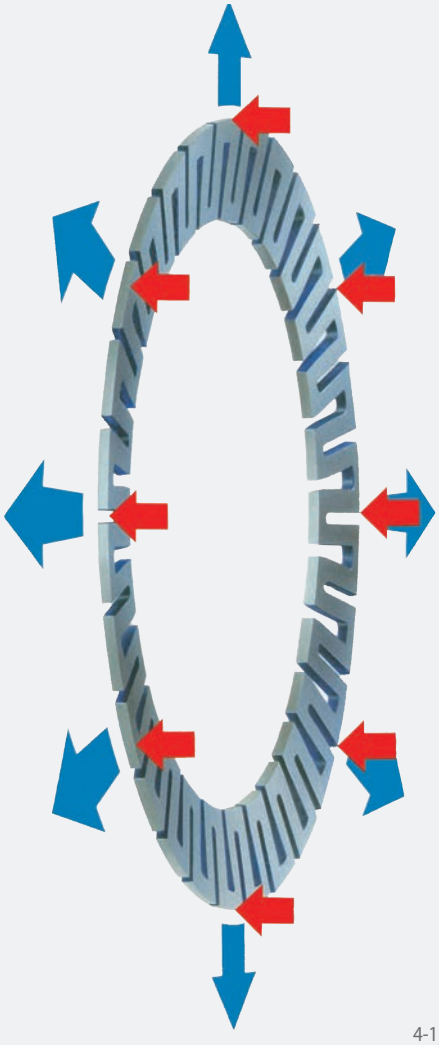
RINGSPANN has been developing and manufacturing Precision Clamping Fixtures for workholding applications for over 65 years. Over the past decades we have realized thousands of applications and numerous technically sophisticated solutions.

RINGSPANN specialized in clamping and centring on cylindrical internal and external surfaces. Typical components include automobile, gear and aircraft components.

We have developed the RINGSPANN system on the basis of the RINGSPANN Clamping Disc, which encompasses

- **Complete Clamping Fixtures,** ready-to-use,
- **Clamping Elements and components** for customer assembled Clamping Fixtures and
- **Clamping Principles** for custom Clamping Fixtures.

The RINGSPANN system offers the right solution for each clamping application and guarantees maximum clamping precision without the need for complicated alignment. This enables customers to achieve difficult objectives, such as clamping in short lengths or clamping thin-walled components that are susceptible to deformation.



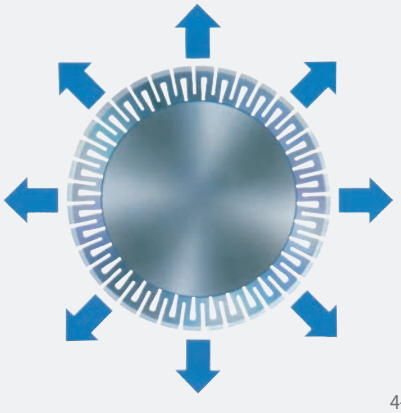
4-1

The basis of the RINGSPANN system is the RINGSPANN Clamping Disc, a flat-tapered ring made of special hardened spring steel. The characteristic slotting provides for especially high elasticity.

4-2

The axial actuating force causes an elastic change in the taper angle and thus alters the diameter of the Clamping Disc. If its inside diameter is supported by a mandrel, the outside diameter expands. If the outside diameter of the Clamping Disc is supported, the inside diameter decreases.

Especially advantageous is the so-called RINGSPANN effect. The initiated actuating force is transposed friction-free into a radial force that is 5 to10 times higher, which is then used to clamp the component.



4-4

Mounted on a mandrel, the Clamping Disc engages the entire inside circumference of the component bore. The radial forces produce a frictional connection between the Clamping Disc and the component.

The uniform application of force to the entire circumference of the component guarantees maximum clamping precision and permits the transmission of higher torques, even in contact with elastic components that are susceptible to deformation.

4-3

The actuating force simultaneously induces a tipping movement of the Clamping Disc. This movement is used to press the component against a longitudinal backstop during clamping.

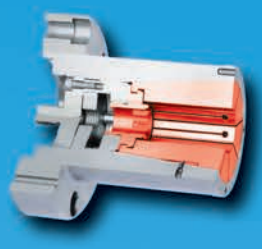
4-5

Similarly, the cylindrical outside surfaces of the component are clamped by a Clamping Disc seated in a chuck.

The RINGSPANN system

Complete Clamping Fixtures
as well as Clamping Elements and components for customer-assembly

Bonded Disc Pack Flange Chucks
(Page 12 - 19)



Taper Collet Flange Chucks
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Taper Sleeve Flange Chucks
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Flat Element Flange Chucks
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Bonded Disc Pack Flange Mandrels
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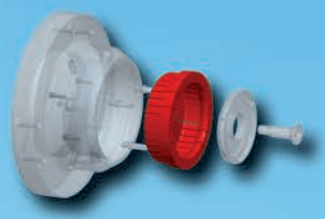
Taper Collet Flange Mandrels
(Page 52 - 61)

Taper Sleeve Flange Mandrels
(Page 62 - 67)

Flat Element Flange Mandrels
(Page 68 - 73)

Clamping Elements
for customer-assembly



Basket Element Clamping Chucks
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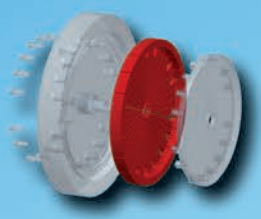
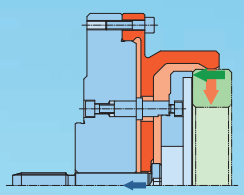
Disc Element Clamping Chucks
(Page 40 - 41)



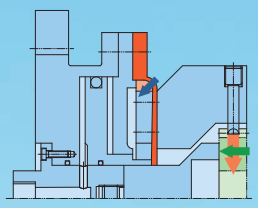
Short Element Clamping Mandrels
(Page 80 - 81)

Disc Element Clamping Mandrels
(Page 82 - 83)

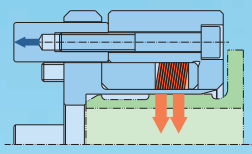
Clamping principles
for customized Clamping Fixtures



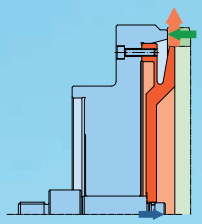
Segmented Diaphragm Clamping Chucks
(Page 42)



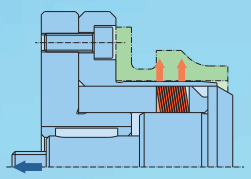
Unslotted Diaphragm Clamping Chucks
(Page 42)



Disc Actuated Bush Clamping Chucks
(Page 43)



Segmented Diaphragm Clamping Mandrels
(Page 84)



Disc Actuated Bush Clamping Mandrels
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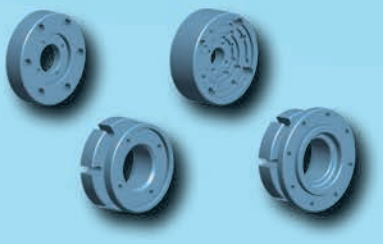
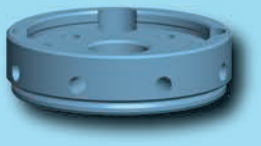
Accessories
for Precision Clamping Fixtures



Intermediate Flanges Z Type A, B, C and P
(Page 86)



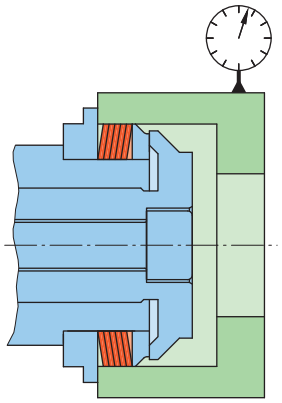
Intermediate Flanges Z Type D
(Page 89)

Spring Force Actuator FUSR
(Page 90)

Features of RINGSPANN Precision Clamping Fixtures

High true running accuracy

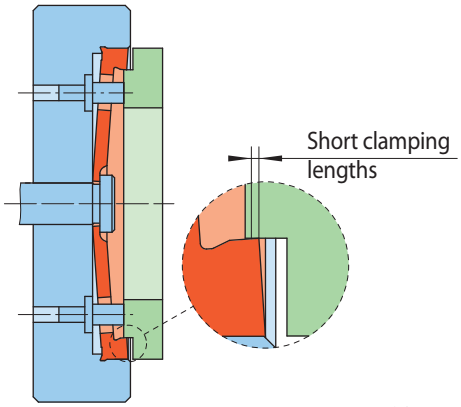
True running accuracy of ≤ 0,01 mm is attainable.



6-1

Short clamping lengths

The RINGSPANN system permits short clamping lengths with high torque transmission.

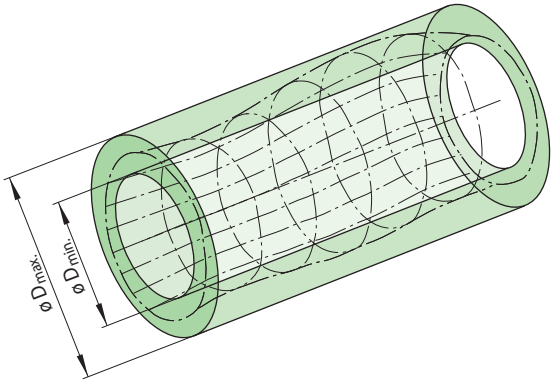


6-2

High component tolerances

The RINGSPANN system supports component tolerances.

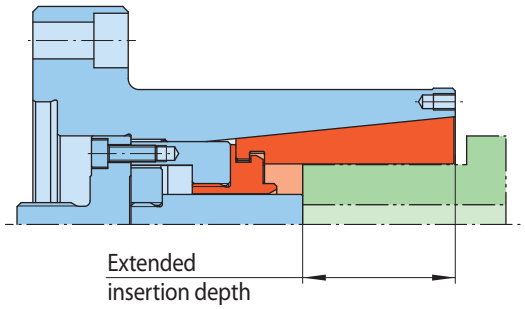
ø $D_{max.}$ - ø $D_{min.}$ = permissible component tolerance



6-3

Extended insertion depths

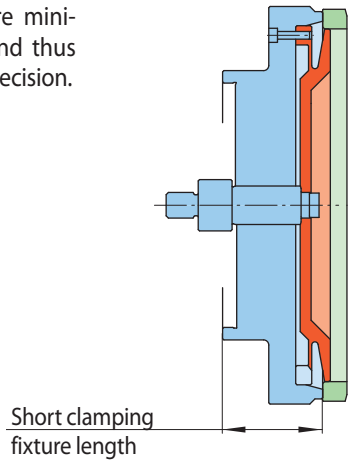
The RINGSPANN system supports extended insertion depths with high torque transmission.



6-4

Short clamping fixture length

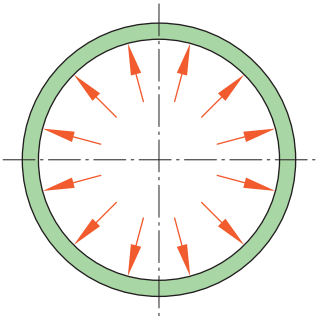
Clamping Fixtures based on the RINGSPANN system ensure minimum spindle overhang and thus high spindle rigidity and precision.



6-5

No deformation

RINGSPANN Clamping Elements engage the entire circumference of the component during clamping. This prevents component deformation. Thus thin-walled components or components that are susceptible to deformation can be clamped firmly and safely. This feature provides for improved machining performance.



6-6

Key: Clamping fixture Clamping Element Component

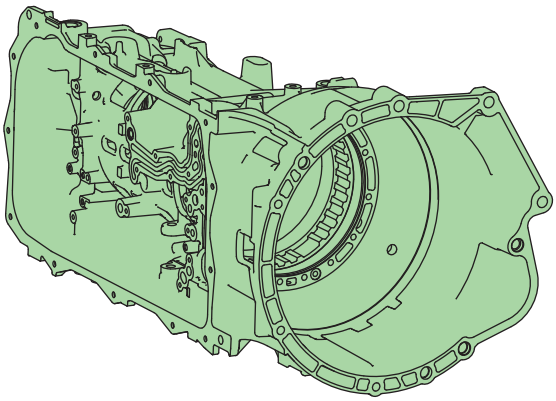
Applications for RINGSPANN Precision Clamping Fixtures

For clamping of …

… automotive components

Application examples — see page

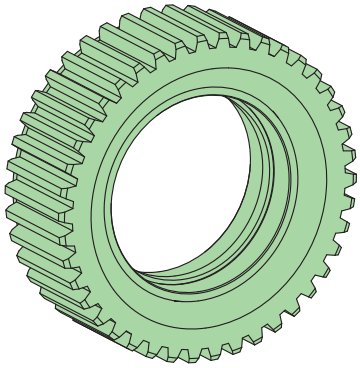
- Screw testing rig 96
- Truck differential case 97
- Truck crown wheel 98
- Car spur gear 99
- Planetary carrier 100
- Turbocharger housing 101
- Gear wheel 102
- Die-cast aluminium housing 103



… industrial gear and pump components

Application examples — see page

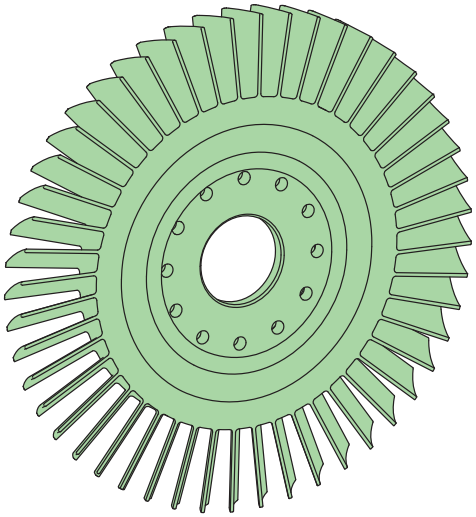
- Pump wheel 104
- Crown wheel 105
- Gear wheel for a wind turbine gear unit 106



… aircraft components

Application examples — see page

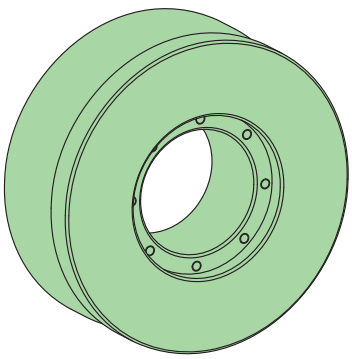
- Gear wheel 107
- Turbine stage of a jet engine 108



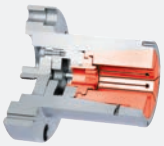
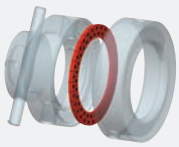
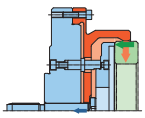
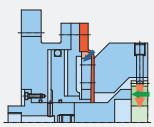
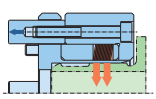
… other components

Application examples — see page

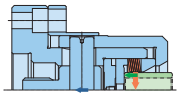
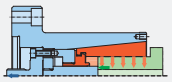
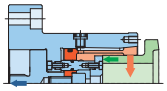
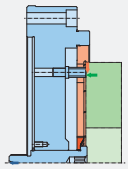
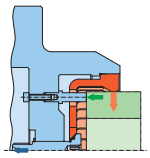
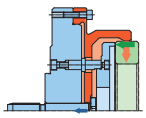
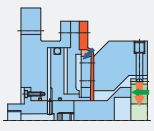
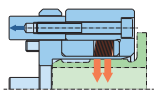
- Thin-walled metering nozzle cover 109
- Forming roller for profile rolling mills 110



Overview of Precision Clamping Chucks

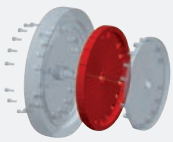
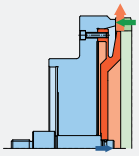
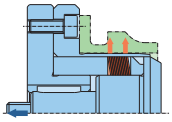
	Precision Clamping Chucks		Clamping diameter			True running accuracy			Permissible component tolerance				
			small < 50 mm	medium 50 - 200 mm	large 200 - 1 600 mm	≤ 0,020 mm	≤ 0,010 mm	≤ 0,005 mm	up to IT 7	up to IT 9	up to IT 11	up to IT 13	up to IT 15
Complete Clamping Fixtures as well as Clamping Elements and components for customer-assembly	Bonded Disc Pack Flange Chucks		from 7 mm to 170 mm			●	●		●	●	●		
	Taper Collet Flange Chucks		from 7,8 mm to 73,6 mm			●	●		●	●	●	●	●
	Taper Sleeve Flange Chucks			from 40 mm to 206 mm		●	●		●	●	●	●	
	Flat Element Flange Chucks			from 35 mm bis 520 mm		●	●		●	●	●		
Clamping Elements for customer-assembly	Basket Element Clamping Chucks			from 40 mm to 340 mm		●	●		●	●	●	●	
	Disc Element Clamping Chucks				from 140 mm to 550 mm	●			●	●	●		
Clamping principles for customized Clamping Fixtures	Segmented Diaphragm Clamping Chucks				from 160 mm to 1 600 mm	●			●	●	●	●	
	Unslotted Diaphragm Clamping Chucks			from 20 mm to 250 mm		●	●		●				
	Disc Actuated Bush Clamping Chucks		from 5 mm to 166 mm			●	●	●	●	●			

Key: Axial actuating force · Radial clamping force · Axial pull-back force

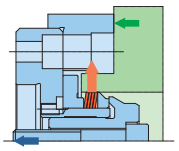
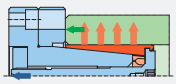
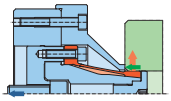
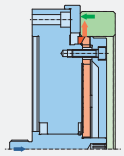
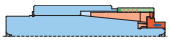
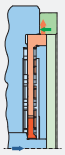
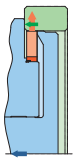
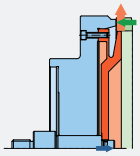
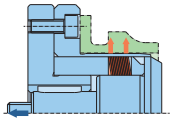
Clamping fixture length		Clamping length		Insertion depth			Pull-back action	Possible component wall thickness		Hand clamping optional possible	Clamping principle	Page
short	long	short	long	very short	short	long		thin	solid			
	●	●	●		●		●	●	●			12 - 19
	●		●	●	●	●	●	●	●			20 - 25
	●		●	●	●	●	●		●	●		26 - 31
●		●		●			●		●	●		32 - 37
●		●		●	●		●		●	●		38 - 39
	●	●		●	●	●	●		●	●		40 - 41
●		●		●	●	●	●	●	●	●		42
	●	●		●	●	●	●		●	●		42
	●	●	●		●	●		●	●	●		43

Key: Axial actuating force Radial clamping force Axial pull-back force

Overview of Precision Clamping Mandrels

	Precision Clamping Mandrels		Clamping diameter			True running accuracy			Permissible component tolerance				
			small < 50 mm	medium 50 - 200 mm	large 200 - 1 600 mm	≤ 0,020 mm	≤ 0,010 mm	≤ 0,005 mm	up to IT 7	up to IT 9	up to IT 11	up to IT 13	up to IT 15
Complete Clamping Fixtures as well as Clamping Elements and components for customer-assembly	Bonded Disc Pack Flange Mandrels		from 18 mm to 200 mm			●	●		●	●	●		
	Taper Collet Flange Mandrels		from 11,9 mm to 129,6 mm			●	●		●	●	●	●	●
	Taper Sleeve Flange Mandrels		from 9 mm to 175 mm			●	●		●	●	●	●	
	Flat Element Flange Mandrels			from 41 mm to 560 mm		●	●		●	●	●		
	Taper Collet Centre Mandrel		from 11,9 mm to 129,6 mm			●	●		●	●	●	●	●
Clamping Elements for customer-assembly	Short Element Clamping Mandrels			from 70 mm to 200 mm		●	●		●	●	●		
	Disc Element Clamping Mandrels				from 200 mm to 450 mm	●			●	●	●		
Clamping principles for customized Clamping Fixtures	Segmented Diaphragm Clamping Mandrels				from 160 mm to 1 600 mm	●			●	●	●	●	
	Disc Actuated Bush Clamping Mandrels			from 22 mm to 205 mm		●	●	●	●	●			

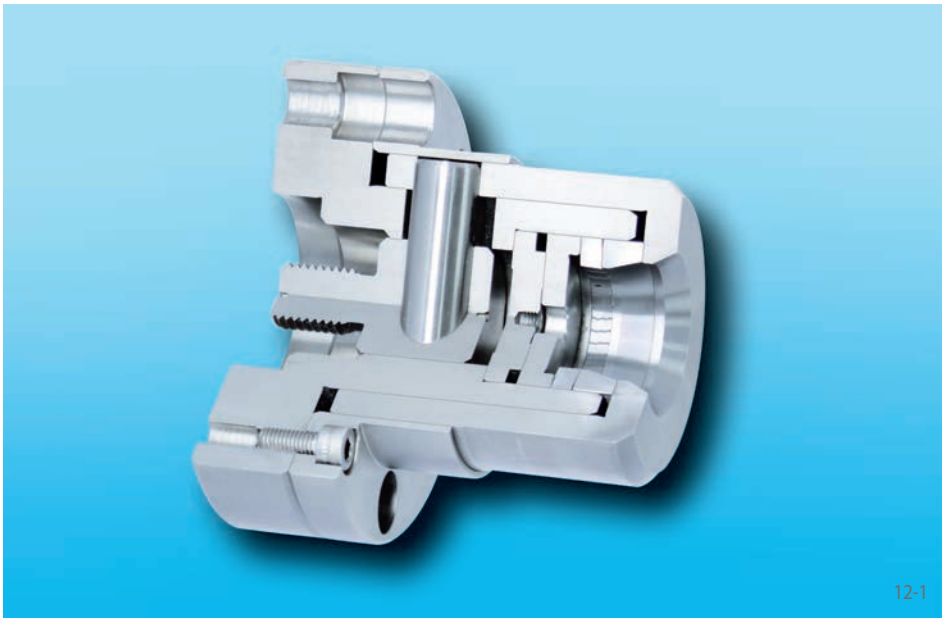
Key: Axial actuating force ↓ Radial clamping force ← Axial pull-back force

Clamping fixture length		Clamping length		Insertion depth			Pull-back action	Possible component wall thickness		Hand clamping optional possible	Clamping principle	Page
short	long	short	long	very short	short	long		thin	solid			
	●	●	●		●		●	●	●	●		44 - 51
	●		●		●	●	●	●	●	●		52 - 61
	●		●	●	●		●		●			62 - 67
●		●		●			●		●	●		68 - 73
	●		●		●	●	●	●	●	●		74 - 79
●		●		●			●		●	●		80 - 81
	●	●		●	●	●	●		●	●		82 - 83
●		●		●	●	●	●	●	●	●		84
	●	●	●		●	●		●	●	●		85

Key: Axial actuating force Radial clamping force Axial pull-back force

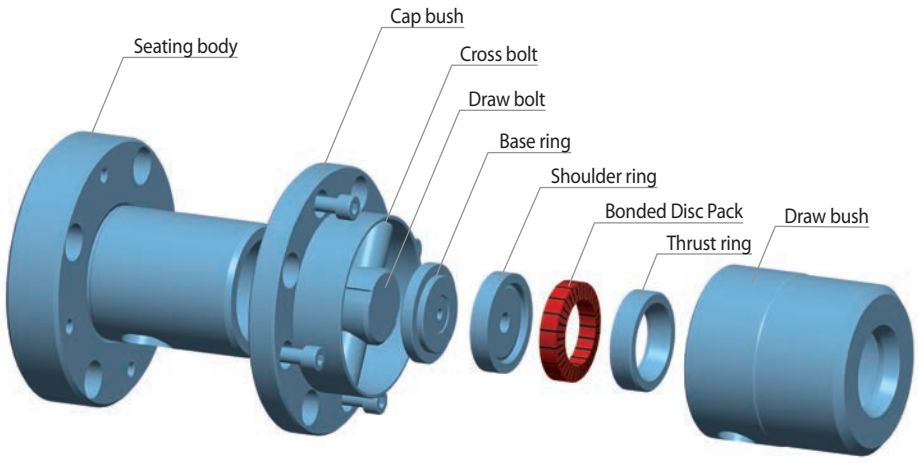
Bonded Disc Pack Flange Chucks LAFF

as Complete Clamping Fixture



Features

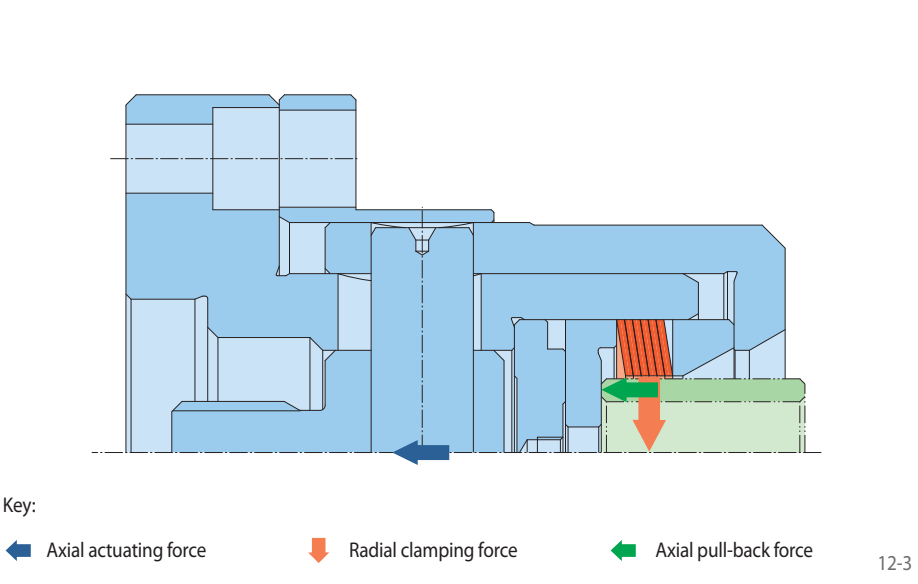
- For clamping diameters from 7 mm to 80 mm
- High true running accuracy ≤ 0,01 mm
- Permissible component tolerance up to IT11
- Short or long clamping length possible
- Pull-back against shoulder ring
- For thin-walled or solid components
- Impervious to ingress of foreign objects due to the rubberized slots in the Bonded Disc Pack



Configuration

The Bonded Disc Pack Flange Chuck consists of a seating body, a cap bush, draw and cross bolts, base and shoulder rings, a Bonded Disc Pack, a thrust ring and a draw bush. The Bonded Disc Pack Flange Chuck is attached to the machine with the seating body. The Clamping Fixture is actuated via the draw bolt, which is connected to the machine power actuating unit. Depending on the required transmitted torque, Bonded Disc Packs of different widths may be installed. The required installation configurations for the base and shoulder rings are shown in Fig. 13-2.

Intermediate Flanges and Spring Force Actuators are shown starting on page 86.

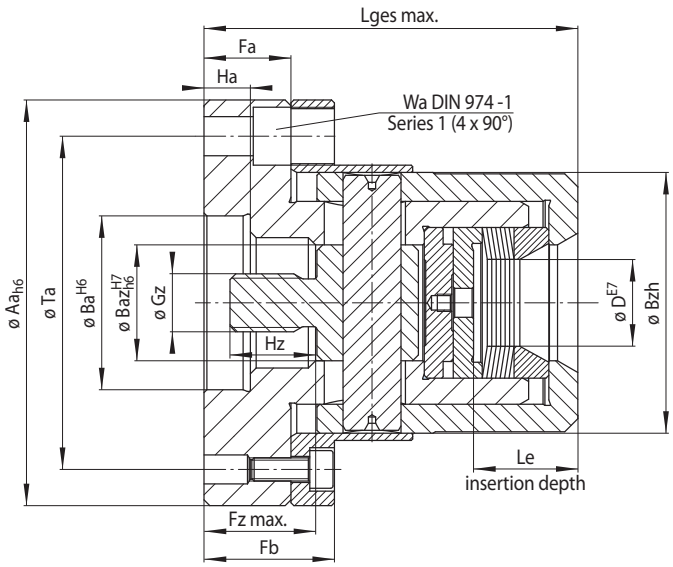


Clamping principle

The Bonded Disc Pack sits pre-loaded in the seating diameter of the seating body. To actuate clamping, the Bonded Disc Pack is raised to an upright position by axial actuating force. The component is centred, pressed flush against the shoulder ring and aligned. The tipping movement of the Bonded Disc Pack converts the axial actuating force into a radial clamping force that is up to ten times higher.

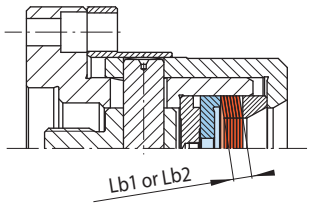
Bonded Disc Pack Flange Chucks LAFF

as Complete Clamping Fixture

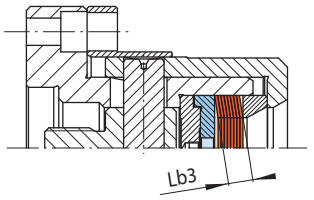


13-1

Installation situations



Bonded disc pack widths Lb1 and Lb2



Bonded disc pack width Lb3

13-2

Size	Achievable clamping diameter	Maximum diameter change**	Bonded disc pack width Lb1			Bonded disc pack width Lb2			Bonded disc pack width Lb3			Aa	Ba	Baz	Bzh	Fa	Fb	Fz max.	Gz	Ha	Hz	Le	Lges max.	Ta	Wa
	D* mm	Δ D mm	Lb1 mm	M Nm	Fm kN	Lb2 mm	M Nm	Fm kN	Lb3 mm	M Nm	Fm kN	mm	mm	mm	mm	mm	mm	mm		mm	mm	mm	mm	mm	
LAFF 22	7 - 10	0,10	4	2,3	1,4	6	3,5	2,1	8	4,6	2,8	90	50	17	40	30	45	33,9	M 10	14	15	20	93,3	70	8
	10 - 15	0,10	4	5,6	2,4	6	8,4	3,5	8	10	4,7	90	50	17	40	30	45	33,9	M 10	14	15	20	93,3	70	8
LAFF 32	10 - 15	0,15	6	8,0	3,6	9	10	5,3	12	10	7,1	90	50	25	55	30	45	38,5	M 12	16	20	20	115	70	8
	15 - 20	0,15	6	20	6,0	9	30	8,9	12	40	11,9	90	50	25	55	30	45	38,5	M 12	16	20	20	115	70	8
LAFF 42	20 - 25	0,15	6	30	8,0	9	50	12,0	12	60	16,0	120	60	35	70	30	45	36	M 16	16	25	32	123	95	10
	25 - 30	0,15	6	60	10,8	9	90	16,2	12	120	21,6	120	60	35	70	30	45	36	M 16	16	25	32	123	95	10
LAFF 52	30 - 35	0,15	6	80	12,4	9	120	18,6	12	160	24,8	140	60	40	90	30	45	39	M 20	16	30	36	129	115	12
	35 - 40	0,15	6	120	15,6	9	180	23,4	12	240	31,2	140	60	40	90	30	45	39	M 20	16	30	36	129	115	12
LAFF 62	40 - 45	0,15	6	160	17,6	9	240	26,4	12	320	35,2	160	90	45	100	35	50	45	M 24	21	35	37	142	135	12
	45 - 50	0,15	6	200	20,8	9	310	31,2	12	410	41,6	160	90	45	100	35	50	45	M 24	21	35	37	142	135	12
LAFF 80	50 - 55	0,25	6	250	22,2	10	420	37,0	16	670	59,2	200	125	55	125	35	50	46,7	M 24	21	35	43,7	164,5	175	12
	55 - 60	0,25	6	300	25,2	10	510	42,0	16	810	67,2	200	125	55	125	35	50	46,7	M 24	21	35	43,7	164,5	175	12
LAFF 90	60 - 65	0,25	6	370	27,0	10	620	45,0	16	990	72,0	200	125	65	140	35	50	41,7	M 24	21	35	44,7	175,5	175	12
	65 - 70	0,25	6	430	30,0	10	730	50,0	16	1 160	80,0	200	125	65	140	35	50	41,7	M 24	21	35	44,7	175,5	175	12
LAFF 100	70 - 75	0,25	6	510	31,8	10	850	53,0	16	1 360	84,8	225	125	70	160	35	50	41,7	M 24	21	35	44,7	175,5	200	12
	75 - 80	0,25	6	580	35,4	10	980	59,0	16	1 560	94,4	225	125	70	160	35	50	41,7	M 24	21	35	44,7	175,5	200	12

* Clamping diameter from > up to ≤ adjustable to two places after the decimal point
** of the clamping diameter of the Clamping Element.

Key

D = Achievable clamping diameter
Δ D = Maximum diameter change of the clamping diameter of the Clamping Element
Lb = Bonded disc pack width
M = Max. transmissible torque
Fm = Required actuating force for component clamping with pull-back action

Example for ordering

Please indicate the size of the Clamping Fixture and the clamping diameter of your component, including component tolerance, and the desired bonded disc pack width in your order:

Size:	LAFF 42
Clamping diameter:	21,47 mm
Component tolerance:	h6
Bonded disc pack width:	9 mm

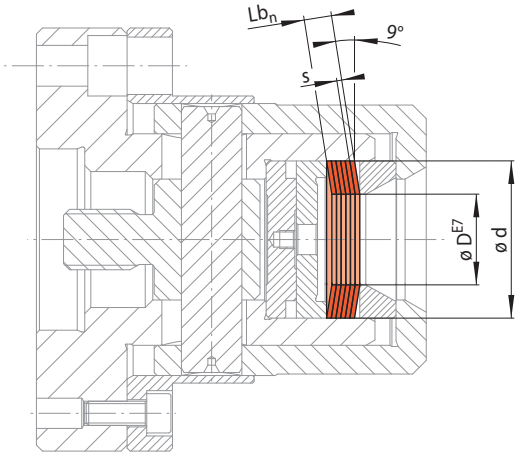
➡ LAFF 42-21,47h6-9

Customer assembly

The Bonded Disc Packs and components shown on pages 14 to 19 are available for customer assembled Bonded Disc Pack Flange Chucks.

Clamping Elements Bonded Disc Packs LAF

for customer assembled Bonded Disc Pack Flange Chucks for setup to different clamping diameters within a given size

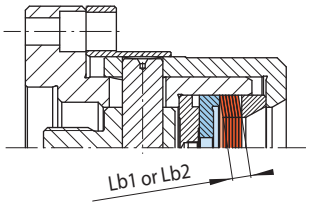


14-1

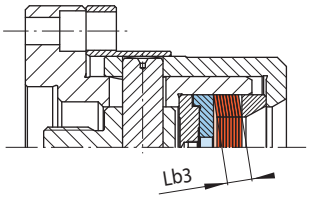
Key

d = Seating diameter
D = Achievable clamping diameter
Δ D = Maximum diameter change of the clamping diameter of the Clamping Element
s = Clamping disc thickness
n = Number of Clamping Discs (max. 16)
Lb_n = s • n
= Bonded disc pack width
M_n = M_1 • n
= Max. transmissible torque
Fm_n = Fm_1 • n
= Required actuating force for component clamping with pull-back action
Fo_n = Fo_1 • n
= Required actuating force for component clamping without pull-back action

Installation situations



Bonded disc pack widths Lb1 and Lb2



Bonded disc pack width Lb3

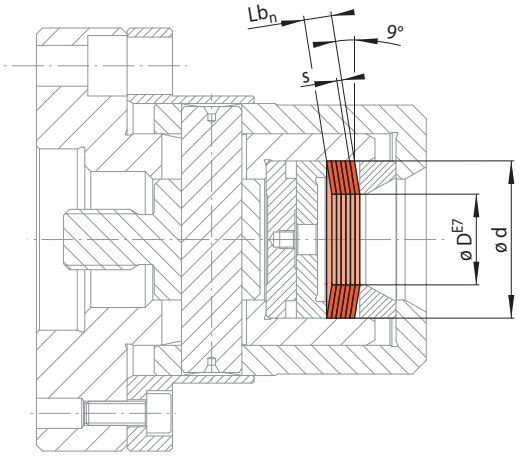
14-2

Size LAF …			Clamping Discs LAF					Bonded Disc Packs LAF													
								Bonded disc pack width Lb1					Bonded disc pack width Lb2					Bonded disc pack width Lb3			
d	D*	Δ D	s	M_1	Fm_1	Fo_1	Art.-No.	Lb1	M_n	Fm_n	Fo_n	Art.-No.	Lb2	M_n	Fm_n	Fo_n	Art.-No.	Lb3	M_n	Fm_n	Fo_n	Art.-No.
mm	mm	mm	mm	Nm	N	N	1002-	mm	Nm	N	N	3022-	mm	Nm	N	N	3022-	mm	Nm	N	N	3022-
18	7 - 10	0,10	0,50	0,3	180	120	018007	4	2,3	1500	1000	018007	6	3,5	2200	1500	018008	8	4,6	2900	2000	018009
22	7 - 10	0,10	0,50	0,3	170	110	022001	4	2,3	1400	900	022001	6	3,5	2100	1400	022002	8	4,6	2800	1800	022003
	10 - 15	0,10	0,50	0,7	290	190	022004	4	5,6	2400	1600	022004	6	8,4	3500	2400	022005	8	10	4700	3100	022006
27	10 - 15	0,15	0,75	1,0	460	320	027004	6	8,0	3700	2600	027004	9	10	5600	3900	027005	12	10	7400	5200	027006
32	10 - 15	0,15	0,75	1,0	440	300	032001	6	8,0	3600	2400	032001	9	10	5300	3600	032002	12	10	7100	4800	032003
	15 - 20	0,15	0,75	2,5	740	510	032004	6	20	6000	4100	032004	9	30	8900	6200	032005	12	40	11900	8200	032006
37	15 - 20	0,15	0,75	2,5	710	480	037001	6	20	5700	3900	037001	9	30	8600	5900	037002	12	40	11400	7700	037003
	20 - 25	0,15	0,75	4,7	1060	730	037004	6	30	8500	5900	037004	9	50	12800	8900	037005	12	60	17000	11700	037006
42	20 - 25	0,15	0,75	4,7	1000	680	042001	6	30	8000	5500	042001	9	50	12000	8300	042002	12	60	16000	10900	042003
	25 - 30	0,15	0,75	7,5	1350	930	042004	6	60	10800	7500	042004	9	90	16200	11300	042005	12	120	21600	14900	042006
47	25 - 30	0,15	0,75	7,5	1300	870	047001	6	60	10400	7000	047001	9	90	15600	10500	047002	12	120	20800	14000	047003
	30 - 35	0,15	0,75	10	1650	1100	047004	6	80	13200	8800	047004	9	120	19800	13200	047005	12	160	26400	17600	047006
52	30 - 35	0,15	0,75	10	1550	1050	052001	6	80	12400	8400	052001	9	120	18600	12600	052002	12	160	24800	16800	052003
	35 - 40	0,15	0,75	15	1950	1350	052004	6	120	15600	10800	052004	9	180	23400	16200	052005	12	240	31200	21600	052006
57	35 - 40	0,15	0,75	15	1850	1250	057001	6	120	14800	10000	057001	9	180	22200	15000	057002	12	240	29600	20000	057003
	40 - 45	0,15	0,75	20	2250	1550	057004	6	160	18000	12400	057004	9	240	27000	18600	057005	12	320	36000	24800	057006
62	40 - 45	0,15	0,75	20	2200	1450	062001	6	160	17600	11600	062001	9	240	26400	17400	062002	12	320	35200	23200	062003
	45 - 50	0,15	0,75	26	2600	1800	062004	6	200	20800	14400	062004	9	310	31200	21600	062005	12	410	41600	28800	062006
67	45 - 50	0,15	0,75	26	2500	1650	067001	6	200	20000	13200	067001	9	310	30000	19800	067002	12	410	40000	26400	067003
	50 - 55	0,15	0,75	32	2900	2000	067004	6	250	23200	16000	067004	9	380	34800	24000	067005	12	500	46400	32000	067006
70	50 - 55	0,15	0,75	32	2800	1900	070001	6	250	22400	15200	070001	9	380	33600	22800	070002	12	500	44800	30400	070003
	45 - 50	0,25	1,00	34	3400	2350	070004	6	200	20400	14100	070004	10	340	34000	23500	070005	16	540	54400	37600	070006
75	45 - 50	0,25	1,00	34	3300	2200	075001	6	200	19800	13200	075001	10	340	33000	22000	075002	16	540	52800	35200	075003
	50 - 55	0,25	1,00	42	3800	2600	075004	6	250	22800	15600	075004	10	420	38000	26000	075005	16	670	60800	41600	075006
80	50 - 55	0,25	1,00	42	3700	2450	080001	6	250	22200	14700	080001	10	420	37000	24500	080002	16	670	59200	39200	080003
	55 - 60	0,25	1,00	51	4200	2900	080004	6	300	25200	17400	080004	10	510	42000	29000	080005	16	810	67200	46400	080006
85	55 - 60	0,25	1,00	51	4100	2700	085001	6	300	24600	16200	085001	10	510	41000	27000	085002	16	810	65600	43200	085003
	60 - 65	0,25	1,00	62	4600	3200	085004	6	370	27600	19200	085004	10	620	46000	32000	085005	16	990	73600	51200	085006
90	60 - 65	0,25	1,00	62	4500	3000	090001	6	370	27000	18000	090001	10	620	45000	30000	090002	16	990	72000	48000	090003
	65 - 70	0,25	1,00	73	5000	3500	090004	6	430	30000	21000	090004	10	730	50000	35000	090005	16	1160	80000	56000	090006
95	65 - 70	0,25	1,00	73	4900	3300	095001	6	430	29400	19800	095001	10	730	49000	33000	095002	16	1160	78400	52800	095003
	70 - 75	0,25	1,00	85	5500	3800	095004	6	510	33000	22800	095004	10	850	55000	38000	095005	16	1360	88000	60800	095006
100	70 - 75	0,25	1,00	85	5300	3600	100001	6	510	31800	21600	100001	10	850	53000	36000	100002	16	1360	84800	57600	100003
	75 - 80	0,25	1,00	98	5900	4100	100004	6	580	35400	24600	100004	10	980	59000	41000	100005	16	1560	94400	65600	100006
105	75 - 80	0,25	1,00	98	5700	3800	105001	6	580	34200	22800	105001	10	980	57000	38000	105002	16	1560	91200	60800	105003
	80 - 85	0,25	1,00	110	6400	4400	105004	6	660	38400	26400	105004	10	1100	64000	44000	105005	16	1760	102400	70400	105006

* Clamping diameter from > up to ≤ adjustable to two places after the decimal point

Clamping Elements Bonded Disc Packs LAF

for customer assembled Bonded Disc Pack Flange Chucks for setup to different clamping diameters within a given size

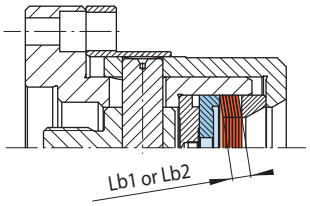


15-1

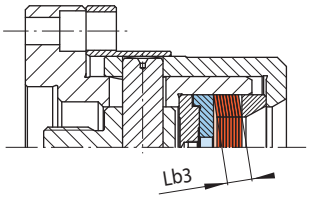
Key

d = Seating diameter
D = Achievable clamping diameter
Δ D = Maximum diameter change of the clamping diameter of the Clamping Element
s = Clamping disc thickness
n = Number of Clamping Discs (max. 16)
Lb_n = s • n
= Bonded disc pack width
M_n = M_1 • n
= Max. transmissible torque
Fm_n = Fm_1 • n
= Required actuating force for component clamping with pull-back action
Fo_n = Fo_1 • n
= Required actuating force for component clamping without pull-back action

Installation situations



Bonded disc pack widths Lb1 and Lb2



Bonded disc pack width Lb3

15-2

Size LAF …			Clamping Discs LAF					Bonded Disc Packs LAF													
								Bonded disc pack width Lb1					Bonded disc pack width Lb2					Bonded disc pack width Lb3			
d	D*	Δ D	s	M_1	Fm_1	Fo_1	Art.-No.	Lb1	M_n	Fm_n	Fo_n	Art.-No.	Lb2	M_n	Fm_n	Fo_n	Art.-No.	Lb3	M_n	Fm_n	Fo_n	Art.-No.
mm	mm	mm	mm	Nm	N	N	1002-	mm	Nm	N	N	3022-	mm	Nm	N	N	3022-	mm	Nm	N	N	3022-
110	80 - 85	0,25	1,00	110	6100	4100	110001	6	660	36600	24600	110001	10	1100	61000	41000	110002	16	1760	97600	65600	110003
	85 - 90	0,25	1,00	130	6800	4700	110004	6	780	40800	28200	110004	10	1300	68000	47000	110005	16	2080	108800	75200	110006
115	85 - 90	0,25	1,00	130	6500	4400	115001	6	780	39000	26400	115001	10	1300	65000	44000	115002	16	2080	104000	70400	115003
	90 - 95	0,25	1,00	140	7200	5000	115004	6	840	43200	30000	115004	10	1400	72000	50000	115005	16	2240	115200	80000	115006
120	90 - 95	0,25	1,00	140	7000	4700	120001	6	840	42000	28200	120001	10	1400	70000	47000	120002	16	2240	112000	75200	120003
	95 - 100	0,25	1,00	160	7700	5300	120004	6	960	46200	31800	120004	10	1600	77000	53000	120005	16	2560	123200	84800	120006
125	95 - 100	0,25	1,00	160	7400	5000	125001	6	960	44400	30000	125001	10	1600	74000	50000	125002	16	2560	118400	80000	125003
	100 - 105	0,25	1,00	180	8100	5600	125004	6	1080	48600	33600	125004	10	1800	81000	56000	125005	16	2880	129600	89600	125006
130	95 - 100	0,35	1,25	170	8000	5500	130007	6,3	850	40400	27800	130001	10	1360	64200	44200	130002	20	2720	128400	88400	130003
	100 - 105	0,35	1,25	190	8800	6100	130009	6,3	950	44400	30800	130001	10	1520	70500	48900	130002	20	3040	141000	97800	130003
140	95 - 100	0,35	1,25	170	7700	5200	140007	6,3	850	38900	26300	140001	10	1360	61800	41800	140002	20	2720	123600	83600	140003
	100 - 105	0,35	1,25	190	8400	5700	140009	6,3	950	42400	28800	140010	10	1520	67400	45800	140011	20	3040	134800	91600	140012
	105 - 110	0,35	1,25	210	8900	6200	140011	6,3	1050	44900	31300	140004	10	1680	71300	49700	140005	20	3360	142600	99400	140006
	110 - 115	0,35	1,25	230	9800	6800	140013	6,3	1150	49400	34300	140004	10	1840	78500	54500	140005	20	3680	157000	109000	140006
150	115 - 120	0,35	1,25	260	10100	7000	150011	6,3	1310	51000	35300	150001	10	2080	81000	56100	150002	20	4160	162000	112200	150003
	120 - 125	0,35	1,25	290	11000	7700	150013	6,3	1460	55500	38900	150001	10	2320	88100	61800	150002	20	4640	176200	123600	150003
160	115 - 120	0,35	1,25	260	9800	6600	160007	6,3	1310	49400	33300	160001	10	2080	78500	52900	160002	20	4160	157000	105800	160003
	120 - 125	0,35	1,25	290	10500	7200	160009	6,3	1460	53000	36300	160001	10	2320	84200	57700	160002	20	4640	168400	115400	160003
	125 - 130	0,35	1,25	310	11000	7600	160011	6,3	1560	55500	38400	160004	10	2480	88100	61000	160005	20	4960	176200	122000	160006
	130 - 135	0,35	1,25	340	11900	8400	160013	6,3	1710	60000	42400	160004	10	2720	95300	67400	160005	20	5440	190600	134800	160006
170	135 - 140	0,35	1,25	370	12200	8400	170011	6,3	1860	61500	42400	170001	10	2960	97700	67400	170002	20	5920	195400	134800	170003
	140 - 145	0,35	1,25	400	13200	9200	170013	6,3	2010	66600	46400	170001	10	3200	105800	73700	170002	20	6400	211600	147400	170003
180	135 - 140	0,35	1,25	370	11800	7900	180007	6,3	1860	59500	39900	180001	10	2960	94500	63400	180002	20	5920	189000	126800	180003
	140 - 145	0,35	1,25	400	12500	8500	180009	6,3	2010	63000	42900	180001	10	3200	100000	68100	180002	20	6400	200000	136200	180003
	145 - 150	0,35	1,25	420	13100	9000	180011	6,3	2110	66100	45400	180004	10	3360	105000	72100	180005	20	6720	210000	144200	180006
	150 - 155	0,35	1,25	460	14000	9800	180013	6,3	2310	70600	49400	180004	10	3680	112100	78500	180005	20	7360	224200	157000	180006
190	155 - 160	0,35	1,25	500	14300	9800	190011	6,3	2520	72100	49400	190001	10	4000	114500	78500	190002	20	8000	229000	157000	190003
	160 - 165	0,35	1,25	530	15200	10600	190013	6,3	2670	76700	53500	190001	10	4240	121800	85000	190002	20	8480	243600	170000	190003
200	165 - 170	0,35	1,25	560	15200	10400	200008	6,3	2820	76700	52500	200010	10	4480	121800	83400	200011	20	8960	243600	166800	200012

* Clamping diameter from > up to ≤ adjustable to two places after the decimal point

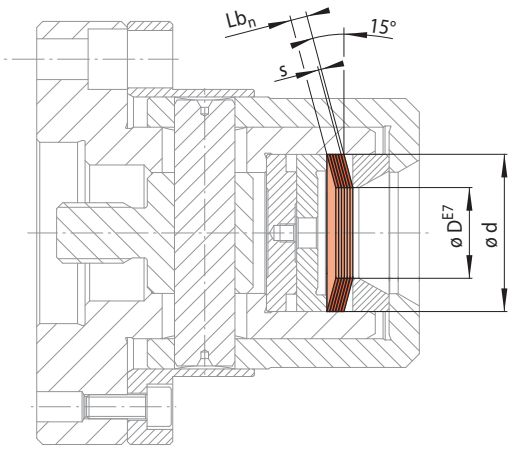
Example for ordering

Please indicate the size of the Clamping Element, the clamping diameter of your component, including component tolerance, and the desired bonded disc pack width in your order:

Size:	LAF 42	
Clamping diameter:	21,47 mm	
Component tolerance:	h6	
Bonded disc pack width:	12 mm	➡ LAF 42-21,47h6-12

Clamping Elements Bonded Disc Packs LFF

for customer assembled Bonded Disc Pack Flange Chucks with large component tolerances for setup to different clamping diameters within a given size

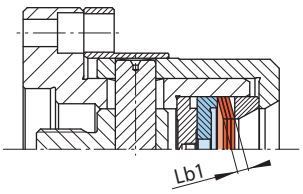


16-1

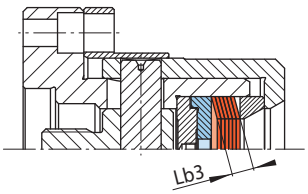
Key

d = Seating diameter
D = Achievable clamping diameter
Δ D = Maximum diameter change of the clamping diameter of the Clamping Element
s = Clamping disc thickness
n = Number of Clamping Discs (max. 12)
Lb_n = s • n
= Bonded disc pack width
M_n = M_1 • n
= Max. transmissible torque
Fm_n = Fm_1 • n
= Required actuating force for component clamping with pull-back action
Fo_n = Fo_1 • n
= Required actuating force for component clamping without pull-back action

Installation situations



Bonded disc pack widths Lb1



Bonded disc pack width Lb3

16-2

Size LFF …			Clamping Discs LFF					Bonded Disc Packs LFF									
								Bonded disc pack width Lb1					Bonded disc pack width Lb3				
d	D*	Δ D	s	M_1	Fm_1	Fo_1	Art.-No.	Lb1	M_n	Fm_n	Fo_n	Art.-No.	Lb3	M_n	Fm_n	Fo_n	Art.-No.
mm	mm	mm	mm	Nm	N	N	1004-	mm	Nm	N	N	3024-	mm	Nm	N	N	3024-
32	10 - 15	0,8	0,9	1,5	800	640	032001	5,4	9	4800	3900	032001	10,8	18	9600	7800	032002
37	15 - 20	0,8	0,9	3,0	1200	960	037001	5,4	18	7200	5800	037001	10,8	36	14400	11600	037002
42	20 - 25	0,8	0,9	5,7	1700	1350	042001	5,4	34	10200	8100	042001	10,8	68	20400	16200	042002
47	25 - 30	0,8	0,9	8,6	2050	1650	047001	5,4	52	12300	9900	047001	10,8	100	24600	19800	047002
52	30 - 35	0,8	0,9	12	2500	2000	052001	5,4	72	15000	12000	052001	10,8	140	30000	24000	052002
57	35 - 40	0,8	0,9	17	3000	2400	057001	5,4	100	18000	14400	057001	10,8	200	36000	28800	057002
62	40 - 45	0,8	0,9	24	3600	2900	062001	5,4	140	21600	17400	062001	10,8	280	43200	34800	062002
70	45 - 50	1,0	1,15	39	5300	4300	070001	6,9	230	31800	25800	070001	13,8	460	63600	51600	070002
80	50 - 55	1,0	1,15	48	5700	4600	080001	6,9	280	34200	27600	080001	13,8	570	68400	55200	080002
80	55 - 60	1,0	1,15	59	6700	5400	080002	6,9	350	40200	32400	080003	13,8	700	80400	64800	080004
90	60 - 65	1,0	1,15	70	7000	5600	090001	6,9	420	42000	33600	090001	13,8	840	84000	67200	090002
	65 - 70	1,0	1,15	84	8000	6500	090002	6,9	500	48000	39000	090003	13,8	1000	96000	78000	090004
100	70 - 75	1,0	1,15	97	8400	6700	100001	6,9	580	50400	40200	100001	13,8	1150	100800	80400	100002
	75 - 80	1,0	1,15	110	9300	7500	100002	6,9	660	55800	45000	100003	13,8	1320	111600	90000	100004
110	80 - 85	1,0	1,15	130	9700	7800	110001	6,9	780	58200	46800	110001	13,8	1550	116400	93600	110002
	85 - 90	1,0	1,15	150	10700	8700	110002	6,9	900	64200	52200	110003	13,8	1800	128400	104400	110004
120	90 - 100	1,0	1,15	150	10000	8000	120001	6,9	900	60000	48000	120001	13,8	1800	120000	96000	120002
140	100 - 115	1,3	1,5	240	14500	11700	140001	9,0	1440	87000	70200	140001	18,0	2880	174000	140400	140002
150	115 - 125	1,3	1,5	330	17500	14500	150001	9,0	1980	105000	87000	150001	18,0	3960	210000	174000	150002
160	125 - 135	1,3	1,5	390	19500	15500	160001	9,0	2340	117000	93000	160001	18,0	4680	234000	186000	160002
170	135 - 145	1,3	1,5	460	21000	17000	170001	9,0	2760	126000	102000	170001	18,0	5520	252000	204000	170002
180	145 - 165	1,3	1,5	540	23000	18500	180001	9,0	3240	138000	111000	180001	18,0	6480	276000	222000	180002
190	155 - 165	1,3	1,5	620	24500	20000	190001	9,0	3720	147000	120000	190001	18,0	7440	294000	240000	190002

* Clamping diameter from > up to ≤ adjustable to two places after the decimal point
The Bonded Disc Packs LFF have a larger taper angle than the Bonded Disc Packs LAF. This makes it possible to clamp larger component tolerances up to IT14 securely. The achievable true running accuracy is ≤ 0,03 mm. Bonded Disc Packs LFF can also be used in Bonded Disc Pack Flange Chucks. We request that you contact us.

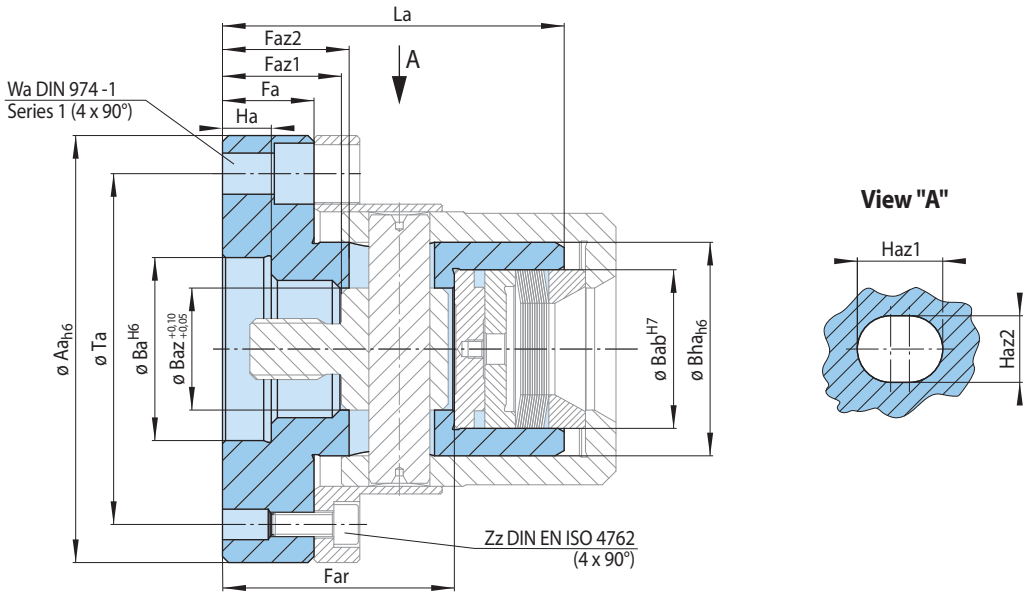
Example for ordering

Please indicate the size of the Clamping Element, the clamping diameter of your component, including component tolerance, and the desired bonded disc pack width in your order:

Size:	LFF 42
Clamping diameter:	21,47 mm
Component tolerance:	h6
Bonded disc pack width:	10,8 mm

➡ LFF 42-21,47h6-10,8

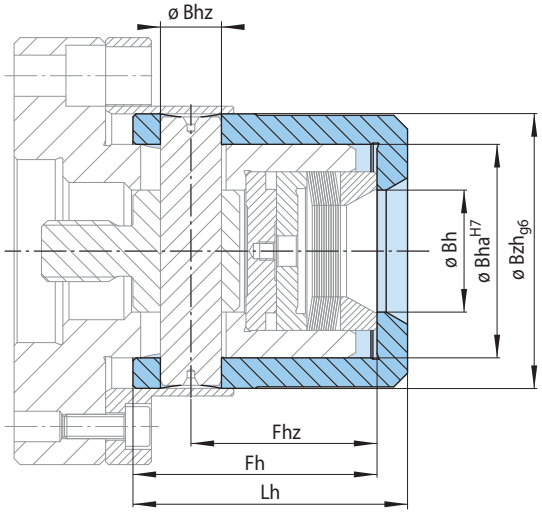
Seating body



17-1

for size	Aa mm	Ba mm	Bab mm	Baz mm	Bha mm	Fa mm	Far mm	Faz1 mm	Faz2 mm	Ha mm	Haz1 mm	Haz2 mm	La mm	Ta mm	Wa	Zz	Art.-No. 2172-
LAFF 22	90	50	22	17	30	30	60,5	34	38	14	14,5	11	85	70	8	M 6	022900
LAFF 32	90	50	32	25	43	30	71	37	41	16	23	16	103	70	8	M 6	032900
LAFF 42	120	60	42	35	55	30	74	37	39,5	16	27	21	108	95	10	M 8	042900
LAFF 52	140	60	52	40	70	30	76	38	41,5	16	28	21	112	115	12	M 8	052900
LAFF 62	160	90	62	45	80	35	87	43	47	21	33	26	125	135	12	M 8	062900
LAFF 80	200	125	80	55	100	35	100	43	50,5	21	40	31	145	175	12	M 8	080900
LAFF 90	200	125	90	65	115	35	110	48	53	21	45	36	155	175	12	M 8	090900
LAFF 100	225	125	100	70	130	35	110	48	53	21	45	36	155	200	12	M 8	100900

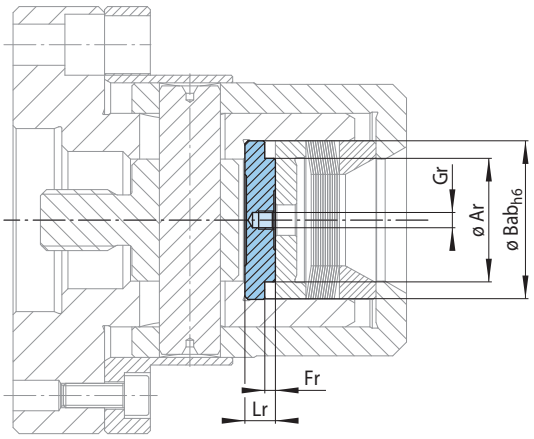
Draw bush



17-2

for size	Bh mm	Bha mm	Bhz mm	Bzh mm	Fh mm	Fhz mm	Lh mm	Art.-No. 2181-
LAFF 22	15,2	30	10	40	52	41,5	57	040900
LAFF 32	20,2	43	15	55	69	54	75	055900
LAFF 42	30,2	55	20	70	77	60	85	070900
LAFF 52	40,2	70	20	90	80	61	90	090900
LAFF 62	50,2	80	25	100	87	65	98	100900
LAFF 80	60,2	100	30	125	106	79	118	125900
LAFF 90	70,2	115	35	140	115	84	128	140900
LAFF 100	80,2	130	35	160	117	84	130	160900

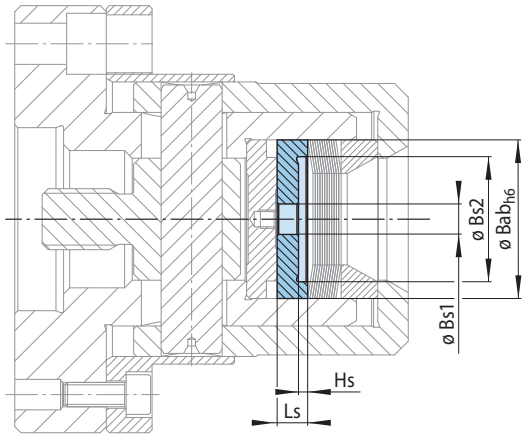
Base ring



18-1

for size	Ar mm	Bab mm	Fr mm	Gr	Lr mm	Art.-No. 2179-
LAFF 22	15,5	22	2,5	M 4	8	022900
LAFF 32	20,5	32	3,5	M 5	9	032900
LAFF 42	30,5	42	3,5	M 5	10	042900
LAFF 52	40,5	52	3,5	M 6	10	052900
LAFF 62	50,5	62	3,5	M 6	10	062900
LAFF 80	60,5	80	6,5	M 6	13	080900
LAFF 90	70,5	90	6,5	M 6	13	090900
LAFF 100	80,5	100	6,5	M 6	13	100900

Shoulder ring

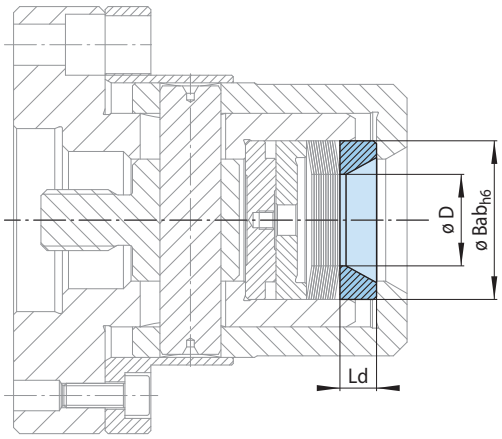


18-2

for size	Bab mm	Bs1[1] mm	Bs2 mm	Hs[2] mm	Ls mm	Art.-No. 2112-
LAFF 22	22	4,5	16	2	7	022960
LAFF 32	32	7	21	3	9	032960
LAFF 42	42	7	31	3	10	042960
LAFF 52	52	10	41	3	10	052960
LAFF 62	62	20	51	3	11	062960
LAFF 80	80	30	61	6	14	080960
LAFF 90	90	40	71	6	14	090960
LAFF 100	100	50	81	6	14	100960

[1] The largest backstop diameter of the component should not be less than diameter Bs1 plus 3 mm. [2] The length of the chamfer on the component should not be less than Hs.

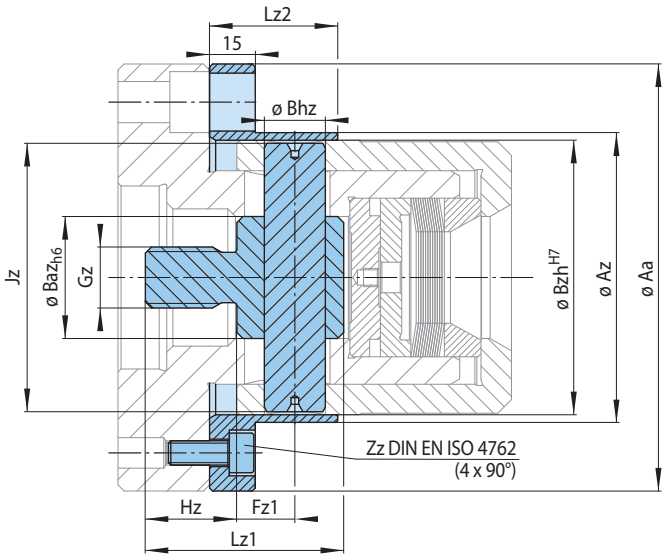
Thrust ring



19-1

for size	Bab mm	D mm	Ld mm	Art.-No. 2178-
LAFF 22	22	7 - 15	5,5	022900
LAFF 32	32	10 - 20	9	032900
LAFF 42	42	20 - 30	10	042900
LAFF 52	52	30 - 40	12	052900
LAFF 62	62	40 - 50	12	062900
LAFF 80	80	50 - 60	13	080900
LAFF 90	90	60 - 70	13	090900
LAFF 100	100	70 - 80	13	100900

Draw bolt, cross bolt, cap bush, cylinder screws

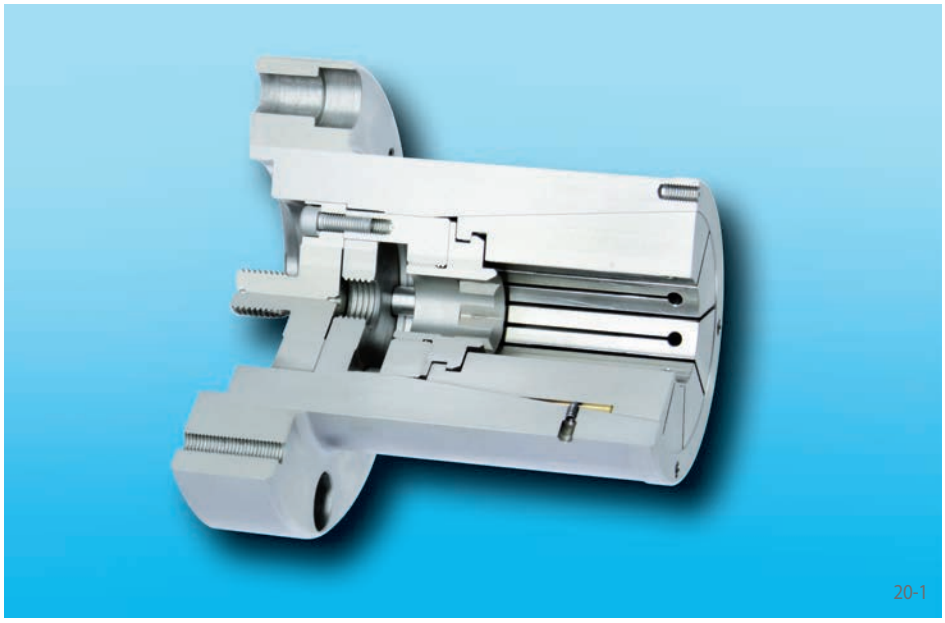


19-2

for size	Aa mm	Az mm	Baz mm	Bhz mm	Bzh mm	Fz1 mm	Gz	Hz mm	Jz mm	Lz1 mm	Lz2 mm	Zz	Art.-No. 3725-
LAFF 22	90	50	17	10	40	13	M 10	15	39,0	38	30	M 6	017900
LAFF 32	90	59	25	15	55	16,5	M 12	20	53,2	50	35	M 6	025900
LAFF 42	120	76	35	20	70	19	M 16	25	68,0	60	40	M 8	035900
LAFF 52	140	95	40	20	90	19	M 20	30	88,0	65	42	M 8	040900
LAFF 62	160	110	45	25	100	21	M 24	35	97,2	75	47	M 8	045900
LAFF 80	200	135	55	30	125	27	M 24	35	122,0	85	60	M 8	055900
LAFF 90	200	150	65	35	140	37	M 24	35	136,2	100	70	M 8	065900
LAFF 100	225	170	70	35	160	37	M 24	35	156,6	100	70	M 8	070900

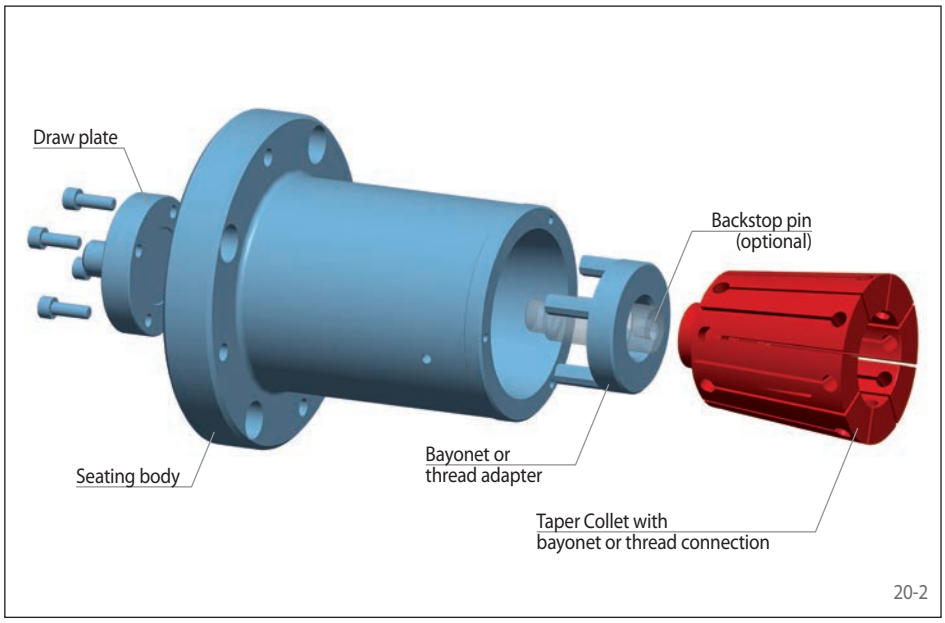
Taper Collet Flange Chucks BKFF

as Complete Clamping Fixture



Features

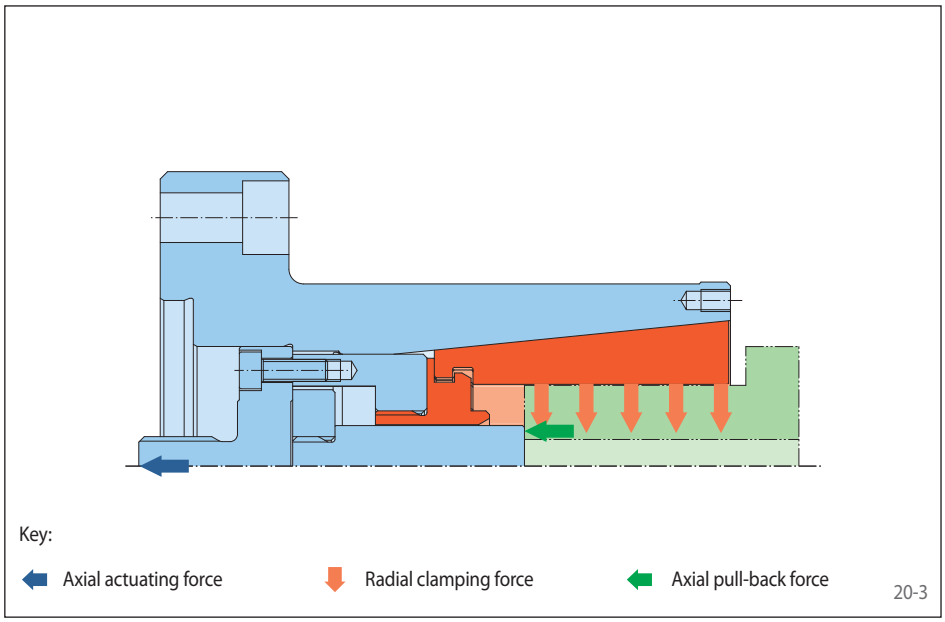
- For clamping diameters from 7,8 mm to 73,6 mm
- High true running accuracy ≤ 0,01 mm
- Permissible component tolerance up to IT15
- Extended insertion depth
- Pull-back against external backstop surface or optional individually designed internal backstop pin
- For thin-walled or solid components



Configuration

The Taper Collet Flange Chuck consists of a draw plate, a seating body, a bayonet or threaded adapter and a Taper Collet. A backstop pin is also available as an option. Depending on its size, the Taper Collet has a bayonet or threaded connection. It is taken up by the seating body in a form-fitting connection and connected via the bayonet or threaded connection with the bayonet or threaded adapter. The Taper Collet Flange Chuck is attached to the machine with the seating body. The Clamping Fixture is actuated by the draw plate, which is connected to the machine power actuating unit.

Intermediate Flanges and Spring Force Actuators are shown starting on page 86.

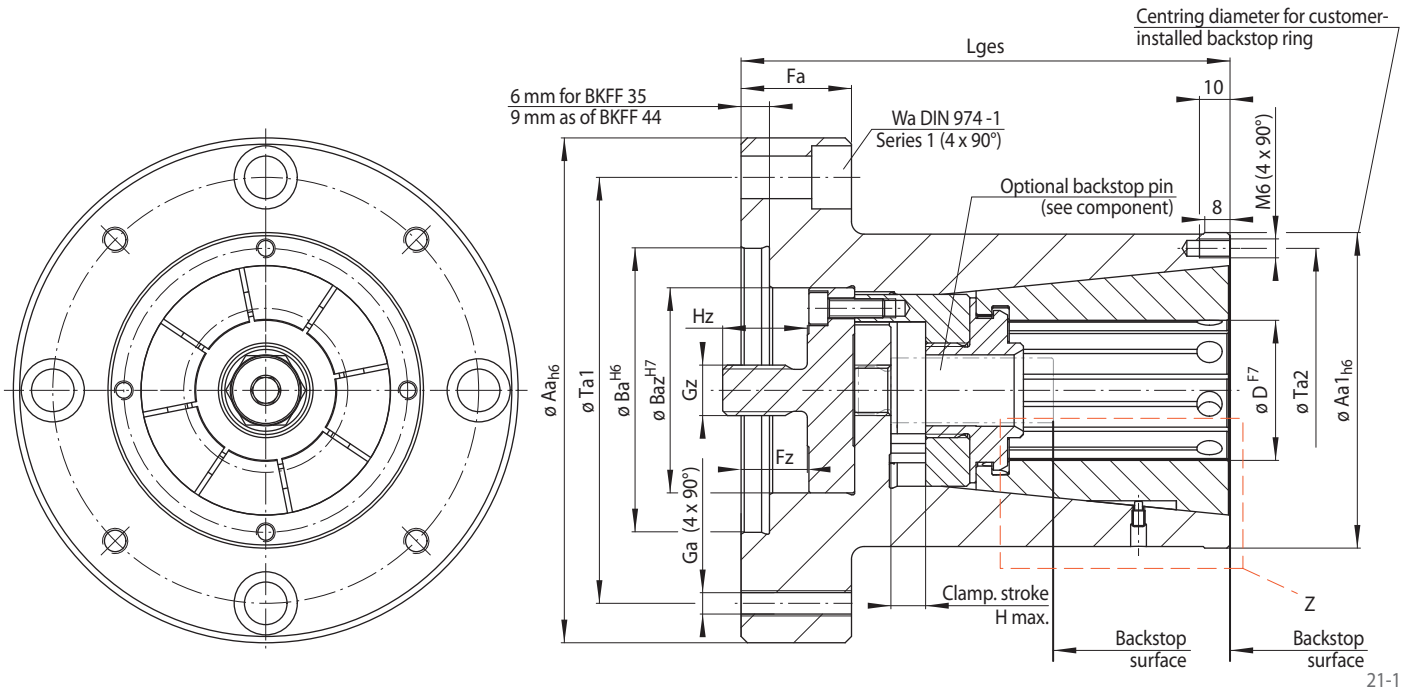


Clamping principle

For clamping, the Taper Collet is pulled against the seating body. The component is centred, pressed against the backstop and aligned flush.

Taper Collet Flange Chucks BKFF

as Complete Clamping Fixture

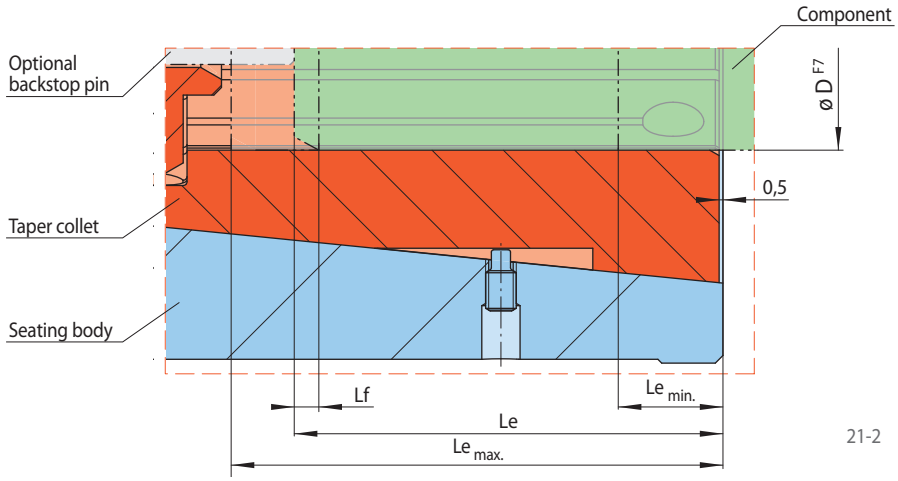


Insertion depth Le

The minimum insertion depth $Le_{min.}$ is measured from the face of the seating body and derived according to the following formula from the length of the chamfer Lf of the component and the constant K:

$Le_{min.} = K + Lf$

Detail "Z"



Size	Clamping range D[1] mm	Maximum diameter change* Δ D mm	Max. transmissible torque** M[2] Nm	Max. Actuating force** F N	Aa mm	Aa1 mm	Ba mm	Baz mm	Fa mm	Fz mm	Ga	Gz	H max. mm	Hz mm	K mm	Le max.[3] mm	Lges mm	Ta1 mm	Ta2 mm	Wa
BKFF 35	7,20 - 14,60	0,6	10 - 20	8500	90	55	50	27	20	10	M 6	M 10	3,5	14	9,5	39,5	93,5	70	45	8
BKFF 44	14,40 - 23,60	0,8	27 - 42	11000	120	70	60	50	30	19	M 8	M 16	5,0	18	12,5	40,5	110	95	60	10
BKFF 56	23,40 - 33,60	1,2	63 - 87	16000	120	75	60	50	30	19	M 8	M 16	7,0	18	21,5	44,5	119	95	65	10
BKFF 79	33,40 - 51,60	2,0	158 - 234	28000	160	100	90	65	35	21	M 8	M 16	11,0	22	25,5	64,5	155	135	90	12
BKFF 110	51,40 – 73,60	2,4	346 - 479	40000	200	135	125	90	35	22,5	M 8	M 20	13,0	28	29,5	88,5	190	175	125	12

* of the clamping diameter of the Clamping Element. • ** for clamping with pull-back action.
[1] Please note the standard clamping ranges according to the table on the next page „Clamping Elements Taper Collets BKF".
[2] The lower value refers to the smallest clamping diameter of the respective size, the higher value to the largest. For values between the two see the table "Taper Collet Clamping Elements" on page 22.
[3] Maximum insertion depth (corresponds to clamping length)

Example for ordering

Please indicate the size of the Clamping Fixture and the clamping range of the requested Taper Collet, in your order:

Size:	BKFF 35
Clamping range:	9,60 - 10,20 mm

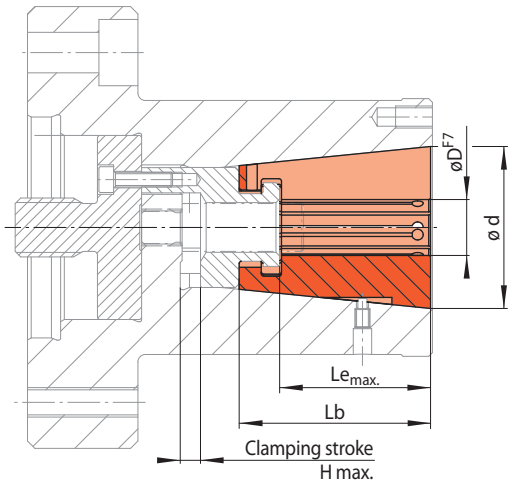
➡ BKFF 79-9,60-10,20

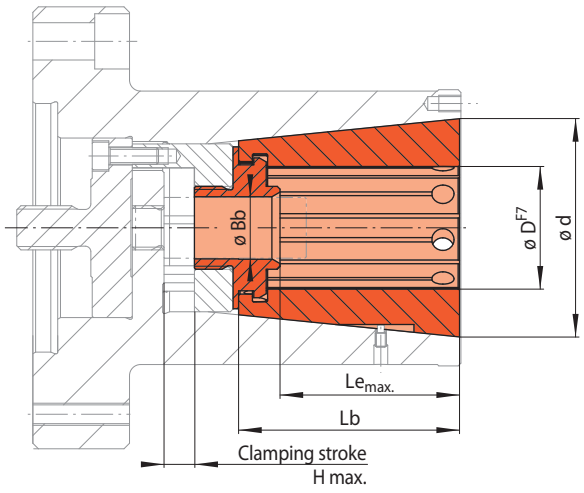
Customer assembly

The Taper Collets and components shown on pages 22 to 25 are available for customer assembled Taper Collet Flange Chucks.

Clamping Elements Taper Collets BKF

for customer assembled Taper Collet Flange Chucks
for setup to different clamping diameters within a given size





Taper Collet with bayonet connection 22-1

Size BKF ... d mm	Clamping range D mm	Max. transmissible torque* M Nm	Max. Actuating force* F N	H max. ** mm	Lb mm	Le max. mm	Art.-No. 2198-
35	7,20 - 7,80	10,0	8500	3,5	50	39,5	035609-007.80
	7,60 - 8,20	11,0	8500	3,5	50	39,5	035609-008.20
	8,00 - 8,60	11,5	8500	3,5	50	39,5	035609-008.60
	8,40 - 9,00	12,0	8500	3,5	50	39,5	035609-009.00
	8,80 - 9,40	12,5	8500	3,5	50	39,5	035609-009.40
	9,20 - 9,80	13,0	8500	3,5	50	39,5	035609-009.80
	9,60 - 10,20	13,5	8500	3,5	50	39,5	035609-010.20
	10,00 - 10,60	14,5	8500	3,5	50	39,5	035609-010.60
	10,40 - 11,00	15,0	8500	3,5	50	39,5	035609-011.00
	10,80 - 11,40	15,5	8500	3,5	50	39,5	035609-011.40
	11,20 - 11,80	16,0	8500	3,5	50	39,5	035609-011.80
	11,60 - 12,20	16,5	8500	3,5	50	39,5	035609-012.20
	12,00 - 12,60	17,0	8500	3,5	50	39,5	035609-012.60
	12,40 - 13,00	17,5	8500	3,5	50	39,5	035609-013.00
	12,80 - 13,40	18,5	8500	3,5	50	39,5	035609-013.40
	13,20 - 13,80	19,0	8500	3,5	50	39,5	035609-013.80
	13,60 - 14,20	19,5	8500	3,5	50	39,5	035609-014.20
	14,00 - 14,60	20,0	8500	3,5	50	39,5	035609-014.60
44	14,40 - 15,20	27	11000	5,0	52	40,5	044600-015.20
	15,00 - 15,80	28	11000	5,0	52	40,5	044600-015.80
	15,60 - 16,40	29	11000	5,0	52	40,5	044600-016.40
	16,20 - 17,00	30	11000	5,0	52	40,5	044600-017.00
	16,80 - 17,60	31	11000	5,0	52	40,5	044600-017.60
	17,40 - 18,20	32	11000	5,0	52	40,5	044600-018.20
	18,00 - 18,80	33	11000	5,0	52	40,5	044600-018.80
	18,60 - 19,40	34	11000	5,0	52	40,5	044600-019.40
	19,20 - 20,00	35	11000	5,0	52	40,5	044600-020.00
	19,80 - 20,60	37	11000	5,0	52	40,5	044600-020.60
	20,40 - 21,20	38	11000	5,0	52	40,5	044600-021.20
	21,00 - 21,80	39	11000	5,0	52	40,5	044600-021.80
	21,60 - 22,40	40	11000	5,0	52	40,5	044600-022.40
	22,20 - 23,00	41	11000	5,0	52	40,5	044600-023.00
	22,80 - 23,60	42	11000	5,0	52	40,5	044600-023.60

* for clamping with pull-back action.
** Clamping stroke H max. describes the load limit of the Clamping Element while activation without component.
Maximum insertion depth $Le_{max.}$ corresponds to clamping length.

Taper Collect with thread connection 22-2

Size BKF ... d mm	Clamping range D mm	Max. transmissible torque* M Nm	Max. Actuating force* F N	Bb mm	H max. ** mm	Lb mm	Le max. mm	Art.-No. 3198-
56	23,40 - 24,60	63	16000	17,5	7,0	55	44,5	056609-024.60
	24,40 - 25,60	66	16000	17,5	7,0	55	44,5	056609-025.60
	25,40 - 26,60	69	16000	17,5	7,0	55	44,5	056609-026.60
	26,40 - 27,60	71	16000	17,5	7,0	55	44,5	056609-027.60
	27,40 - 28,60	74	16000	17,5	7,0	55	44,5	056609-028.60
	28,40 - 29,60	76	16000	17,5	7,0	55	44,5	056609-029.60
	29,40 - 30,60	79	16000	17,5	7,0	55	44,5	056609-030.60
	30,40 - 31,60	82	16000	17,5	7,0	55	44,5	056609-031.60
	31,40 - 32,60	84	16000	17,5	7,0	55	44,5	056609-032.60
	32,40 - 33,60	87	16000	17,5	7,0	55	44,5	056609-033.60
79	33,40 - 35,40	158	28000	22,5	11,0	80	64,5	079600-035.40
	35,20 - 37,20	166	28000	22,5	11,0	80	64,5	079600-037.20
	37,00 - 39,00	174	28000	22,5	11,0	80	64,5	079600-039.00
	38,80 - 40,80	183	28000	22,5	11,0	80	64,5	079600-040.80
	40,60 - 42,60	191	28000	22,5	11,0	80	64,5	079600-042.60
	42,40 - 44,40	200	28000	22,5	11,0	80	64,5	079600-044.40
	44,20 - 46,20	208	28000	22,5	11,0	80	64,5	079600-046.20
	46,00 - 48,00	217	28000	22,5	11,0	80	64,5	079600-048.00
	47,80 - 49,80	225	28000	22,5	11,0	80	64,5	079600-049.80
	49,60 - 51,60	234	28000	22,5	11,0	80	64,5	079600-051.60
110	51,40 - 53,80	346	40000	22,3	13,0	110	88,5	110600-053.80
	53,60 - 56,00	360	40000	22,3	13,0	110	88,5	110600-056.00
	55,80 - 58,20	375	40000	22,3	13,0	110	88,5	110600-058.20
	58,00 - 60,40	390	40000	22,3	13,0	110	88,5	110600-060.40
	60,20 - 62,60	405	40000	22,3	13,0	110	88,5	110600-062.60
	62,40 - 64,80	419	40000	22,3	13,0	110	88,5	110600-064.80
	64,60 - 67,00	443	40000	22,3	13,0	110	88,5	110600-067.00
	66,80 - 69,20	449	40000	22,3	13,0	110	88,5	110600-069.20
	69,00 - 71,40	464	40000	22,3	13,0	110	88,5	110600-071.40
	71,20 - 73,60	479	40000	22,3	13,0	110	88,5	110600-073.60

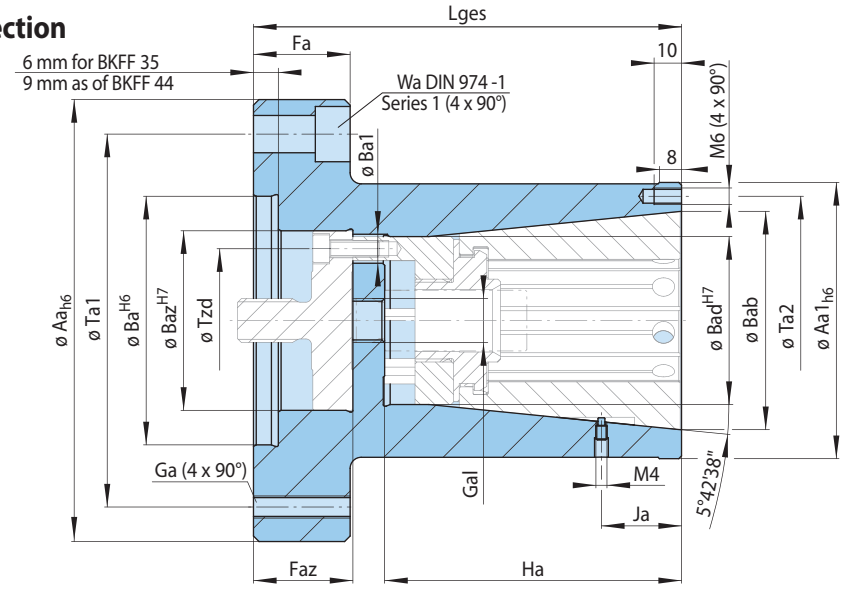
Example for ordering

Please indicate the size of the Clamping Element and the clamping range of the requested Taper Collet, in your order:

Size: BKFF 35
Clamping range: 9,60 - 10,20 mm

➡ BKFF 79-9,60-10,20

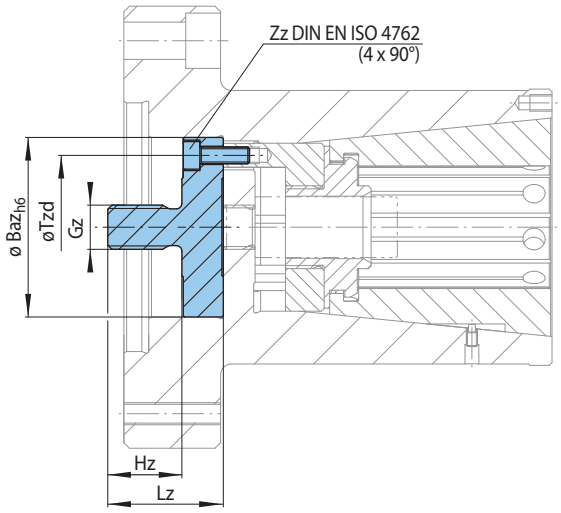
Seating body with anti-twist protection



23-1

for size	Aa mm	Aa1 mm	Ba mm	Ba1 mm	Bab mm	Bad mm	Baz mm	Fa mm	Faz mm	Ga	Gal	Ha mm	Ja mm	Lges mm	Ta1 mm	Ta2 mm	Tzd mm	Wa	Art.-No. 3175-
BKFF 35	90	55	50	7,2	35,1	24,0	27	20	17,5	M 6	M 5	64,5	16,5	93,5	70	45	18	8	035900
BKFF 44	120	70	60	8,0	44,1	32,6	50	30	31,0	M 8	M 10	68,0	19,0	110	95	60	26	10	044900
BKFF 56	120	75	60	10,0	56,1	43,5	50	30	31,0	M 8	M 12	77,5	25,0	119	95	65	35	10	056900
BKFF 79	160	100	90	10,4	79,1	60,8	65	35	36,0	M 8	M 16	107,5	29,0	155	135	90	52	12	079900
BKFF 110	200	135	125	13,5	110,1	85,6	90	35	40,5	M 8	M 16	138,5	24,0	190	175	125	74	12	110900

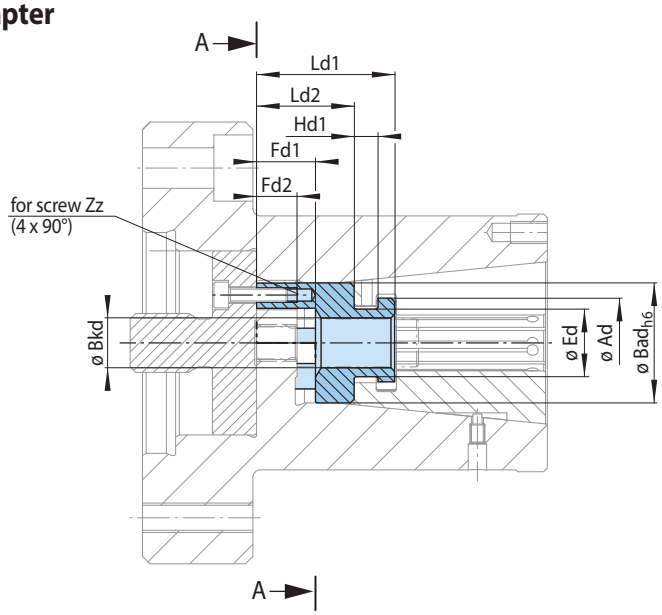
Draw plate with cylinder screws



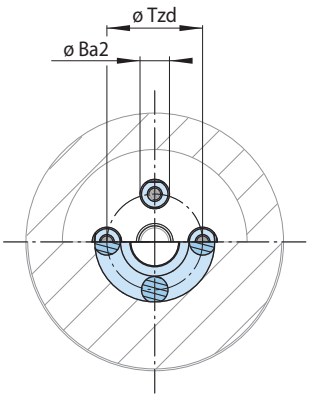
23-2

for size	Baz mm	Gz	Hz mm	Lz mm	Tzd mm	Zz	Art.-No. 3129-
BKFF 35	27	M 10	14	21,5	18	M 4x16	027900
BKFF 44	50	M 16	18	30,0	26	M 4x16	050902
BKFF 56	50	M 16	18	30,0	35	M 6x16	050900
BKFF 79	65	M 16	22	37,0	52	M 6x18	065900
BKFF 110	90	M 20	28	46,0	74	M 8x22	090900

Bayonet adapter



View A - A

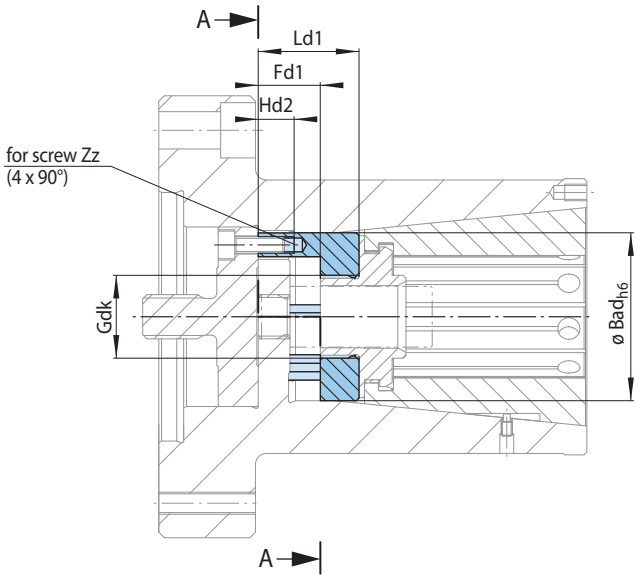


for sizes BKFF 35 and BKFF 44

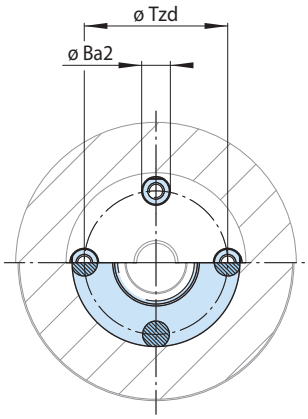
24-1

for size	Ad mm	Ba2 mm	Bad mm	Bkd mm	Ed mm	Fd1 mm	Fd2 mm	Hd1 mm	Ld1 mm	Ld2 mm	Tzd mm	Zz	Art.-No. 2149-
BKFF 35	14,0	6,9	24,0	5,0	8,7	15	14	5,5	35,5	25,5	18	M 4x16	024900
BKFF 44	24,3	7,2	32,6	13,5	18,35	16	11	6,5	37,5	26,5	26	M 4x16	032900

Thread adapter



View A - A

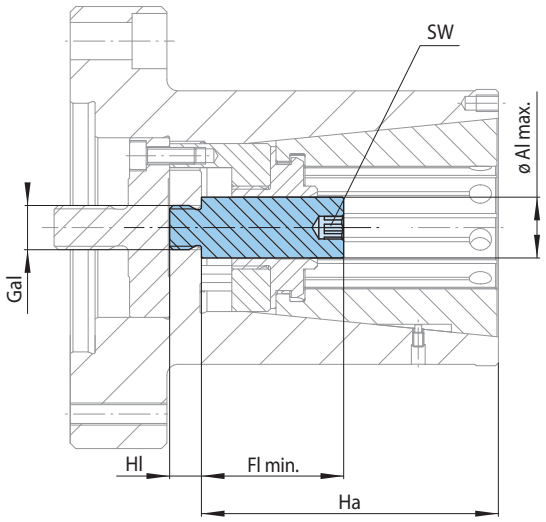


for sizes BKFF 56 to BKFF 110

24-2

for size	Ba2 mm	Bad mm	Fd1 mm	Gdk	Hd2 mm	Ld1 mm	Tzd mm	Zz	Art.-No. 2149-
BKFF 56	9,6	43,5	17,5	M 26x1,5	12	30,5	35	M 6x16	043900
BKFF 79	9,7	60,8	22,5	M 30x1,5	13	36,5	52	M 6x18	060900
BKFF 110	13,0	85,6	24,0	M 30x1,5	16	36,5	74	M 8x22	085900

Backstop pin (optional)



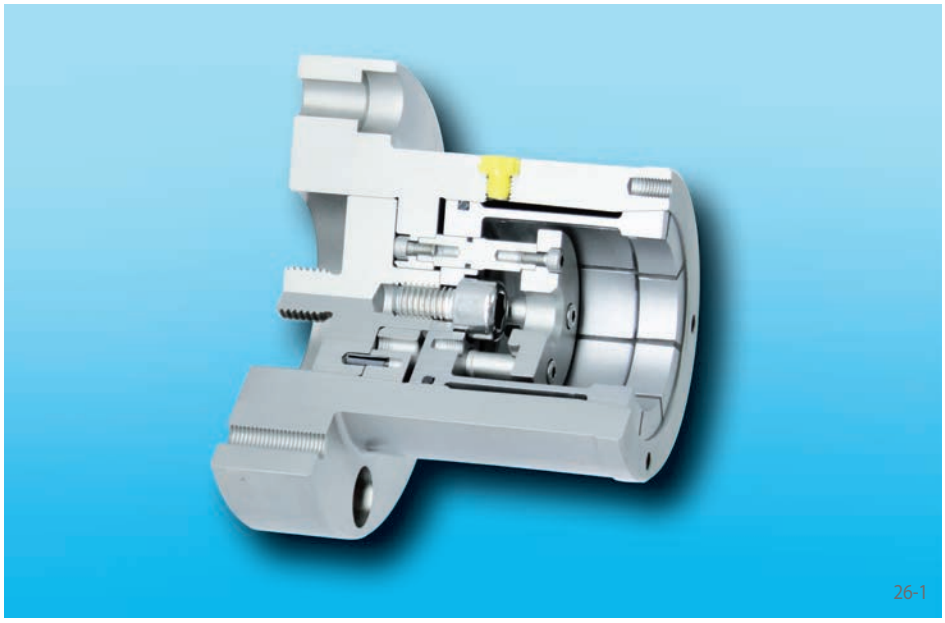
25-1

for size	Al max. mm	Fl min. mm	Gal	Ha mm	Hl mm	SW mm
BKFF 35	5	25,0	M 5	64,5	9,0	4,5*
BKFF 44	13	27,5	M 10	68,0	11,0	6,0
BKFF 56	17	33,0	M 12	77,5	10,5	8,0
BKFF 79	22	43,0	M 16	107,5	11,5	8,0
BKFF 110	22	50,0	M 16	138,5	11,0	10,0

* Hexagon head

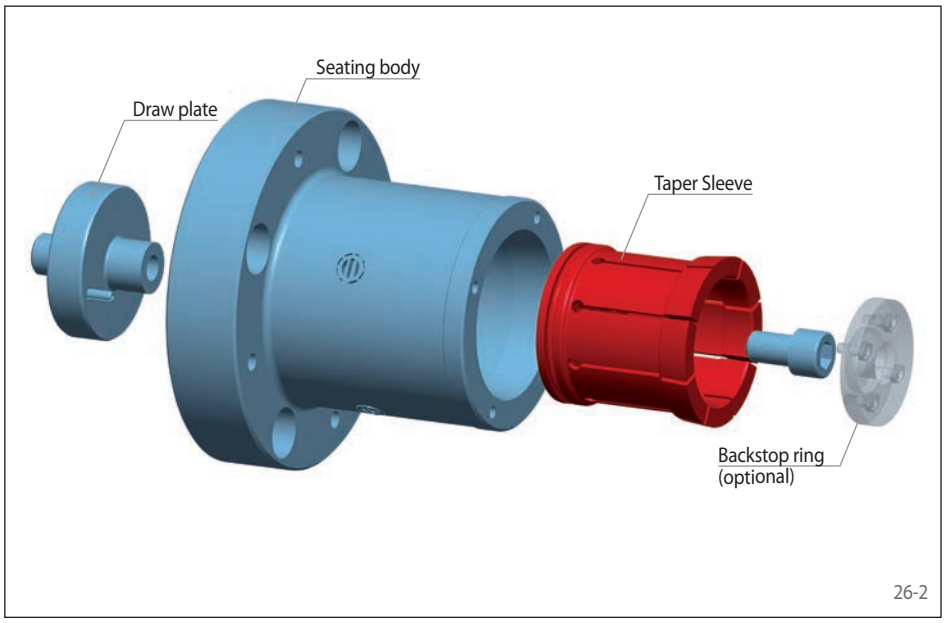
Taper Sleeve Flange Chucks HKFF

as Complete Clamping Fixture



Features

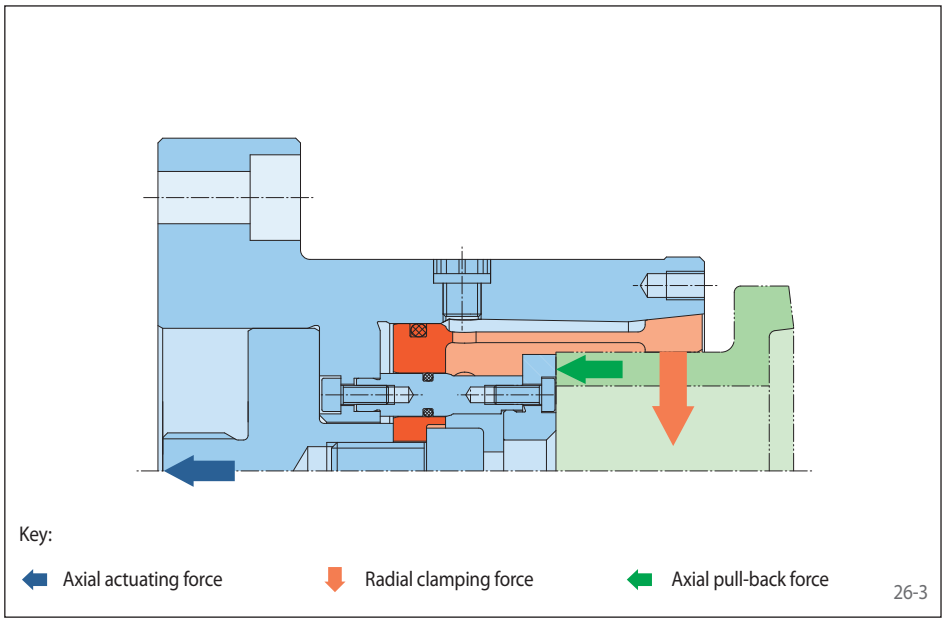
- For clamping diameters from 40 mm to 206 mm
- High true running accuracy ≤ 0,01 mm
- Permissible component tolerance up to IT13
- Extended insertion depth
- Pull-back against external backstop surface, or optional individually designed internal backstop pin
- Hand clamping optional possible
- Impervious to ingress of foreign objects due to the rubberized slots in the Taper Sleeve



Configuration

The Taper Sleeve Flange Chuck consists of a draw plate, a seating body and a Taper Sleeve. A plain parallel ground backstop ring and a plate with a threaded bore for hand clamping are optionally available. The Taper Sleeve Flange Chuck is attached to the machine with the seating body. The Clamping Fixture is actuated by the draw plate, which is connected to the machine power actuating unit.

Intermediate Flanges and Spring Force Actuators are shown starting on page 86.

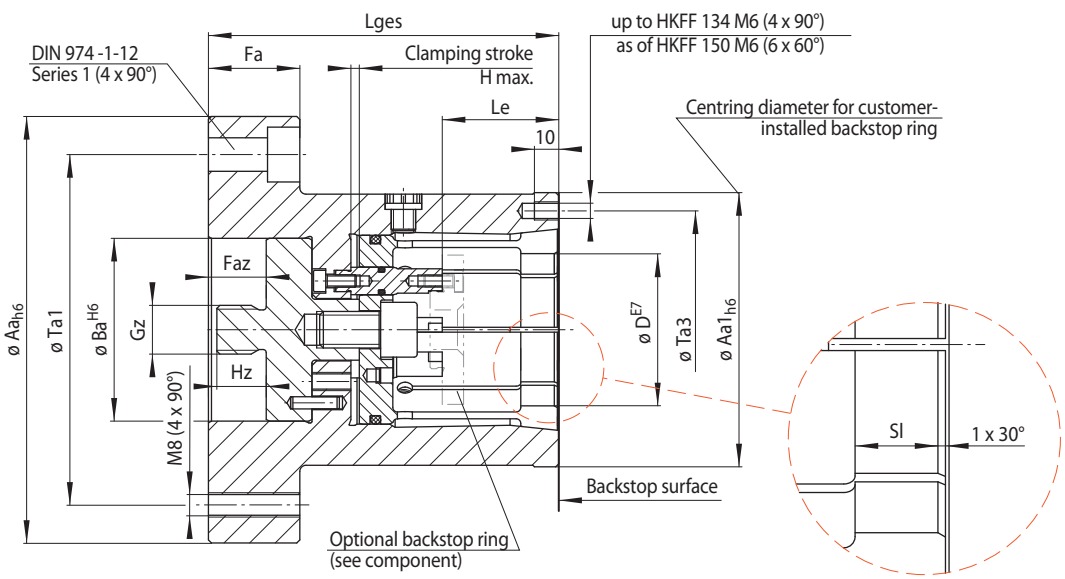


Clamping principle

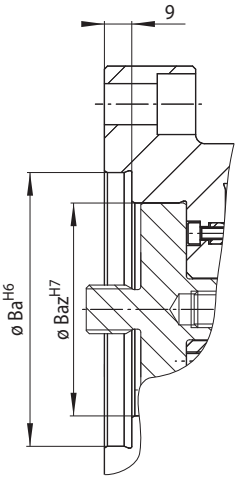
For clamping, the Taper Sleeve is pulled against the seating body. The component is centred, pressed against the backstop and aligned flush.

Taper Sleeve Flange Chucks HKFF

as Complete Clamping Fixture



for sizes HKFF 66 and HKFF 76 27-1



for sizes HKFF 86 to HKFF 225 27-2

Size	Achievable clamping diameter D* mm	Maximum diameter change** ΔD mm	Max. transmissible torque*** M[1] Nm	Max. Actuating force*** F N	Aa mm	Aa1 mm	Ba mm	Baz mm	Fa mm	Faz mm	Gz	H max. mm	Hz mm	Le mm	Lges mm	Sl mm	Ta1 mm	Ta3 mm
HKFF 66	40,00 - 50,50	0,5	130 - 160	20000	140	90	60	-	30	19,0	M 16	2,7	18	38,2	115	11	115	78
HKFF 76	50,00 - 60,50	0,5	160 - 190	20000	140	95	60	-	30	19,0	M 16	2,7	18	38,2	115	11	115	85
HKFF 86	60,00 - 70,50	0,5	240 - 280	25000	160	110	90	70	30	12,0	M 16	2,7	18	38,2	108	11	135	98
HKFF 96	70,00 - 80,50	0,5	280 - 320	25000	160	115	90	70	30	12,0	M 16	2,7	18	38,2	108	11	135	106
HKFF 106	80,00 - 90,50	0,5	390 - 440	30000	185	135	125	84	30	12,0	M 20	2,9	27	39,9	125	13	160	120
HKFF 114	90,00 - 100,50	0,5	440 - 490	30000	185	140	125	84	30	12,0	M 20	2,9	27	39,9	125	13	160	128
HKFF 124	100,00 - 110,50	0,5	570 - 630	35000	200	155	125	105	30	12,0	M 20	2,9	27	39,9	125	13	175	140
HKFF 134	110,00 - 120,50	0,5	630 - 680	35000	225	165	125	105	30	12,0	M 20	2,9	27	39,9	125	13	200	150
HKFF 150	120,00 - 131,00	1,0	685 - 740	35000	225	180	125	80	30	15,5	M 20	6,0	27	57,0	150	14	200	165
HKFF 160	130,00 - 146,00	1,0	740 - 825	35000	250	190	175	80	35	15,5	M 20	6,0	27	62,0	155	14	225	174
HKFF 175	145,00 - 161,00	1,0	820 - 910	35000	250	205	175	80	35	15,5	M 20	6,0	27	72,0	165	14	225	190
HKFF 190	160,00 - 176,00	1,0	905 - 1000	35000	275	225	200	80	40	15,5	M 20	6,0	27	71,0	173	14	280	208
HKFF 205	175,00 - 191,00	1,0	990 - 1080	35000	315	240	240	80	45	15,5	M 20	6,0	27	78,0	180	14	280	222
HKFF 225	190,00 - 206,00	1,0	1075 - 1165	35000	315	260	240	80	45	15,5	M 20	6,0	27	83,0	185	14	280	242

* Clamping diameter adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element. • *** for clamping with pull-back action.
[1] The lower value refers to the smallest clamping diameter of the respective size, the higher value to the largest. For values between the two can be determined through interpolation.

Example for ordering

Please indicate the size of the Clamping Fixture and the clamping diameter of your component, including component tolerance, in your order:

Size:	HKFF 66
Clamping diameter:	50,47 mm
Component tolerance:	h6

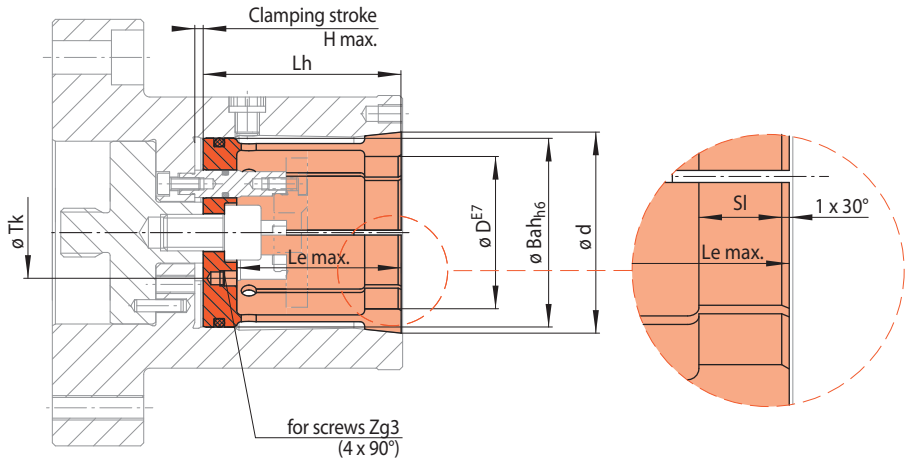
➡ HKFF 66-50,47h6

Customer assembly

The Taper Sleeves and components shown on pages 28 to 30 are available for customer assembled Taper Sleeve Flange Chucks.

Clamping Elements Taper Sleeves HKF

for customer assembled Taper Sleeve Flange Chucks
for setup to different clamping diameters within a given size



28-1

Size HKF … d mm	Achievable clamping diameter D* mm	Maximum diameter change** Δ D mm	Max. transmissible torque*** M[1] Nm	Max. Actuating force*** F N	Bah mm	H max. **** mm	Le max. mm	Lh mm	Sl mm	Tk mm	Zg3	Art.-No. 3198-
66	40,00 - 50,50	0,5	130 - 160	20 000	62	2,7	54	65	11	30	M 5	066600
76	50,00 - 60,50	0,5	160 - 190	20 000	72	2,7	54	65	11	30	M 5	076600
86	60,00 - 70,50	0,5	240 - 280	25 000	82	2,7	54	65	11	30	M 5	086600
96	70,00 - 80,50	0,5	280 - 320	25 000	92	2,7	54	65	11	30	M 5	096600
106	80,00 - 90,50	0,5	390 - 440	30 000	102	2,9	64	78	13	38	M 6	106600
114	90,00 - 100,50	0,5	440 - 490	30 000	110	2,9	64	78	13	38	M 6	114600
124	100,00 - 110,50	0,5	570 - 630	35 000	120	2,9	64	78	13	38	M 6	124600
134	110,00 - 120,50	0,5	630 - 680	35 000	130	2,9	64	78	13	38	M 6	134600
150	120,00 - 131,00	1,0	685 - 740	35 000	143	6,0	78	95	14	38	M 6	150600
160	130,00 - 146,00	1,0	740 - 825	35 000	155	6,0	83	100	14	38	M 6	160600
175	145,00 - 161,00	1,0	820 - 910	35 000	170	6,0	92	110	14	38	M 6	175600
190	160,00 - 176,00	1,0	905 - 1 000	35 000	185	6,0	95	118	14	38	M 6	190600
205	175,00 - 191,00	1,0	990 - 1 080	35 000	200	6,0	102	125	14	38	M 6	205600
225	190,00 - 206,00	1,0	1 075 - 1 165	35 000	220	6,0	107	130	14	38	M 6	225600

* Clamping diameter adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element. • *** for clamping with pull-back action.
**** Clamping stroke H max. describes the load limit of the Clamping Element while activation without component.
[1] The lower value refers to the smallest clamping diameter of the respective size, the higher value to the largest. For values between the two can be determined through interpolation.

Example for ordering

Please indicate the size of the Clamping Element and the clamping diameter of your component, including component tolerance, in your order:

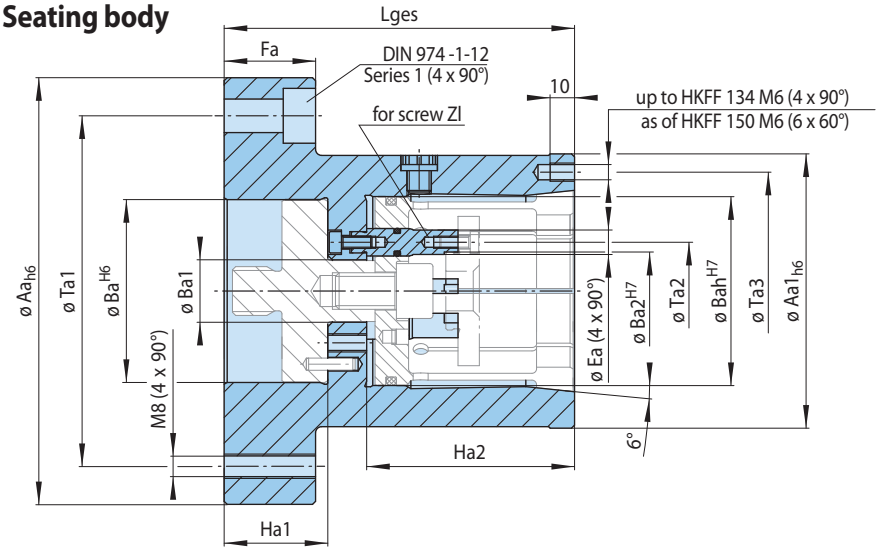
Size:	HKFF 66
Clamping diameter:	50,47 mm
Component tolerance:	h6

➡ HKF 66-50,47h6

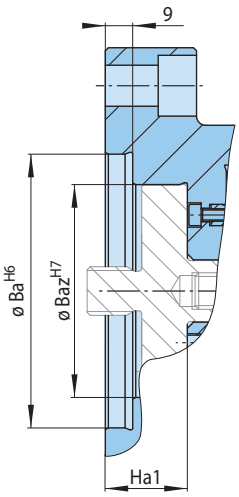
Components

for customer assembled Taper Sleeve Flange Chucks

Seating body



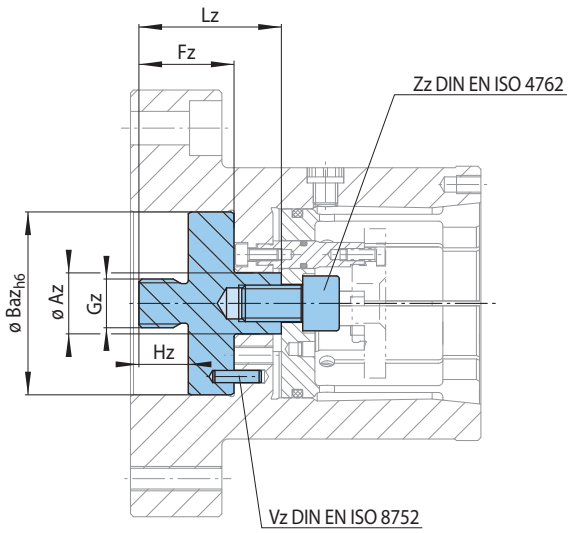
for sizes HKFF 66 and HKFF 76 29-1



for sizes HKFF 86 to HKFF 225 29-2

for size	Aa mm	Aa1 mm	Ba mm	Ba1 mm	Ba2 mm	Bah mm	Baz mm	Ea mm	Fa mm	Ha1 mm	Ha2 mm	Lges mm	Ta1 mm	Ta2 mm	Ta3 mm	ZI	Art.-No. 3175-
HKFF 66	140	90	60	20,5	25,6	62	-	8	30	34,0	68,2	115	115	32	78	M 4	066900
HKFF 76	140	95	60	20,5	33,6	72	-	8	30	34,0	68,2	115	115	40	85	M 4	076900
HKFF 86	160	110	90	20,5	43,6	82	70	8	30	27,0	68,2	108	135	50	98	M 4	086900
HKFF 96	160	115	90	20,5	53,6	92	70	8	30	27,0	68,2	108	135	60	106	M 4	096900
HKFF 106	185	135	125	25,5	55,6	102	84	12	30	28,8	81,4	125	160	66	120	M 5	106900
HKFF 114	185	140	125	25,5	63,6	110	84	12	30	28,8	81,4	125	160	74	128	M 5	114900
HKFF 124	200	155	125	25,5	75,0	120	105	12	30	28,8	81,4	125	175	85	140	M 5	124900
HKFF 134	225	165	125	25,5	85,0	130	105	12	30	28,8	81,4	125	200	95	150	M 5	134900
HKFF 150	225	180	125	30,5	90,0	143	80	13	30	33,0	101,5	150	200	100	165	M 5	150900
HKFF 160	250	190	175	30,5	98,0	155	80	13	35	33,0	106,5	155	225	110	174	M 5	160900
HKFF 175	250	205	175	30,5	113,0	170	80	13	35	33,0	116,5	165	225	125	190	M 5	175900
HKFF 190	275	225	200	30,5	131,0	185	80	13	40	33,0	124,5	173	280	143	208	M 5	190900
HKFF 205	315	240	240	30,5	143,0	200	80	13	45	33,0	131,5	180	280	155	222	M 5	205900
HKFF 225	315	260	240	30,5	162,0	220	80	13	45	33,0	136,5	185	280	173	242	M 5	225900

Draw plate with cylinder screws



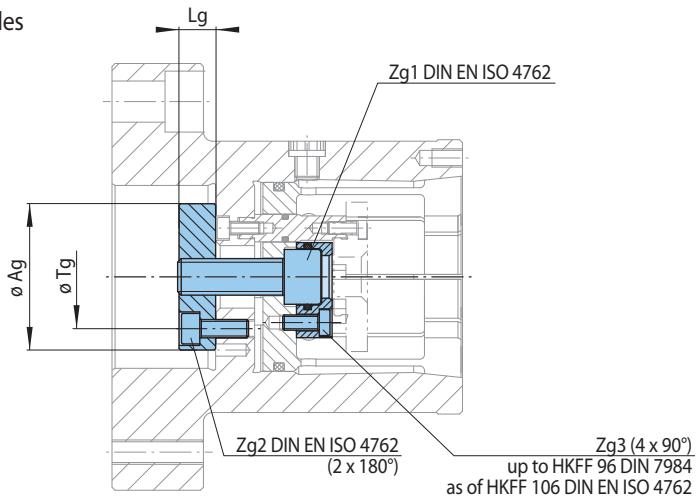
30-1

for size	Az mm	Baz mm	Fz mm	Gz	Hz mm	Lz mm	Vz mm	Zz	Art.-No. 3129-
HKFF 66	20	60*	32,95	M 16	18	48,5	4	M 12x20	060900
HKFF 76	20	60*	32,95	M 16	18	48,5	4	M 12x20	060900
HKFF 86	20	70	32,95	M 16	18	48,5	4	M 12x20	070900
HKFF 96	20	70	32,95	M 16	18	48,5	4	M 12x20	070900
HKFF 106	25	84	43,5	M 20	27	59,4	5	M 16x30	084900
HKFF 114	25	84	43,5	M 20	27	59,4	5	M 16x30	084900
HKFF 124	25	105	43,7	M 20	27	59,5	5	M 16x30	105900
HKFF 134	25	105	43,7	M 20	27	59,5	5	M 16x30	105900
HKFF 150	30	80	44,5	M 20	27	66,5	5	M 16x35	080900
HKFF 160	30	80	44,5	M 20	27	66,5	5	M 16x35	080900
HKFF 175	30	80	44,5	M 20	27	66,5	5	M 16x35	080900
HKFF 190	30	80	44,5	M 20	27	66,5	5	M 16x40	080901
HKFF 205	30	80	44,5	M 20	27	66,5	5	M 16x40	080901
HKFF 225	30	80	44,5	M 20	27	66,5	5	M 16x40	080901

* Corresponds centring diameter Ba of seating body.

Assembly group for hand clamping (optional)

for components with central through bore holes

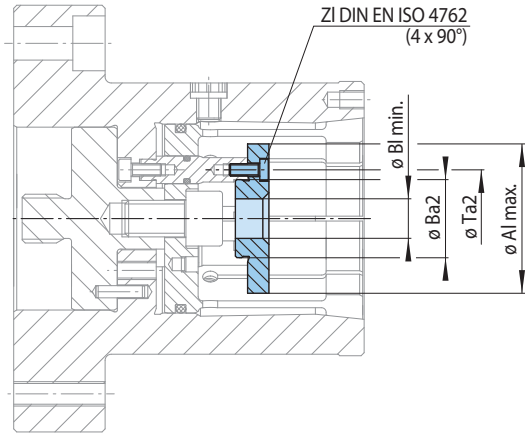


31-1

for size	Ag mm	Lg mm	Tg mm	Zg1	Zg2	Zg3	Art.-No. 3128-
HKFF 66	48	12	34	M 12x35	M 6x16	M 5x12	048902
HKFF 76	48	12	34	M 12x35	M 6x16	M 5x12	048901
HKFF 86	48	12	34	M 12x35	M 6x16	M 5x12	048901
HKFF 96	48	12	34	M 12x35	M 6x20	M 5x12	048901
HKFF 106	68	15	54	M 16x45	M 6x20	M 6x20	068901
HKFF 114	68	15	54	M 16x45	M 6x20	M 6x20	068901
HKFF 124	68	15	54	M 16x45	M 6x20	M 6x20	068901

for size	Ag mm	Lg mm	Tg mm	Zg1	Zg2	Zg3	Art.-No. 3128-
HKFF 134	68	15	54	M 16x45	M 6x20	M 6x20	068901
HKFF 150	68	15	54	M 16x55	M 6x20	M 6x20	068902
HKFF 160	68	15	54	M 16x55	M 6x20	M 6x20	068902
HKFF 175	68	15	54	M 16x55	M 6x20	M 6x20	068902
HKFF 190	68	15	54	M 16x60	M 6x20	M 6x20	068903
HKFF 205	68	15	54	M 16x60	M 6x20	M 6x20	068903
HKFF 225	68	15	54	M 16x60	M 6x20	M 6x20	068903

Backstop ring (optional)



31-2

for size	Al max. mm	Ba2 mm	Bl min. mm	Ta2 mm	Zl
HKFF 66	39	25,6	12,0	32	M 4
HKFF 76	49	33,6	12,0	40	M 4
HKFF 86	59	43,6	12,0	50	M 4
HKFF 96	69	53,6	12,0	60	M 4
HKFF 106	79	55,6	16,5	66	M 5
HKFF 114	89	63,6	16,5	74	M 5
HKFF 124	99	75,0	16,5	85	M 5

for size	Al max. mm	Ba2 mm	Bl min. mm	Ta2 mm	Zl
HKFF 134	109	85,0	16,5	95	M 5
HKFF 150	119	90,0	16,5	100	M 5
HKFF 160	129	98,0	16,5	110	M 5
HKFF 175	144	113,0	16,5	125	M 5
HKFF 190	159	121,0	16,5	143	M 5
HKFF 205	174	143,0	16,5	155	M 5
HKFF 225	189	162,0	16,5	173	M 5

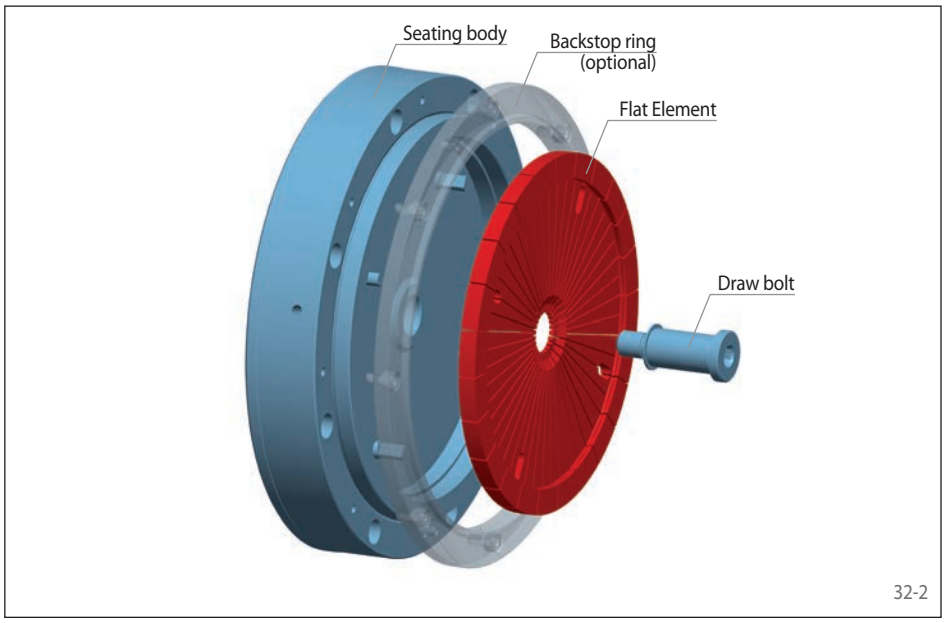
Missing dimensions reflect component geometry.

Flat Element Flange Chucks KFFF

as Complete Clamping Fixture

Features

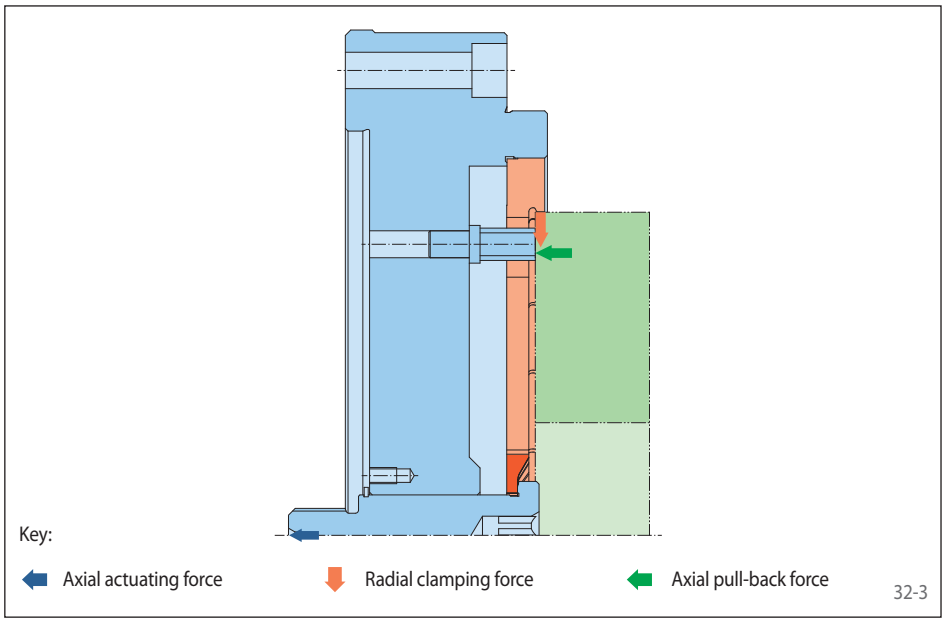
- For clamping diameters from 90 mm to 260 mm
- High true running accuracy ≤ 0,01 mm
- Permissible component tolerance up to IT11
- Very short clamping fixture length
- Short clamping length
- Pull-back against internal backstop pins, external backstop surface or optional, individually designed external backstop ring
- Hand clamping optional possible
- Rubberized slots in the Flat Element



Configuration

The Flat Element Flange Chuck consists of a seating body with backstop pins, a Flat Element and a draw bolt. A backstop ring and an assembly for manual clamping are also available as options. The Flat Element Flange Chuck is attached to the machine with the seating body. The Clamping Fixture is actuated by the draw bolt, which is connected to the machine power actuating unit.

Intermediate Flanges and Spring Force Actuators are shown starting on page 86.

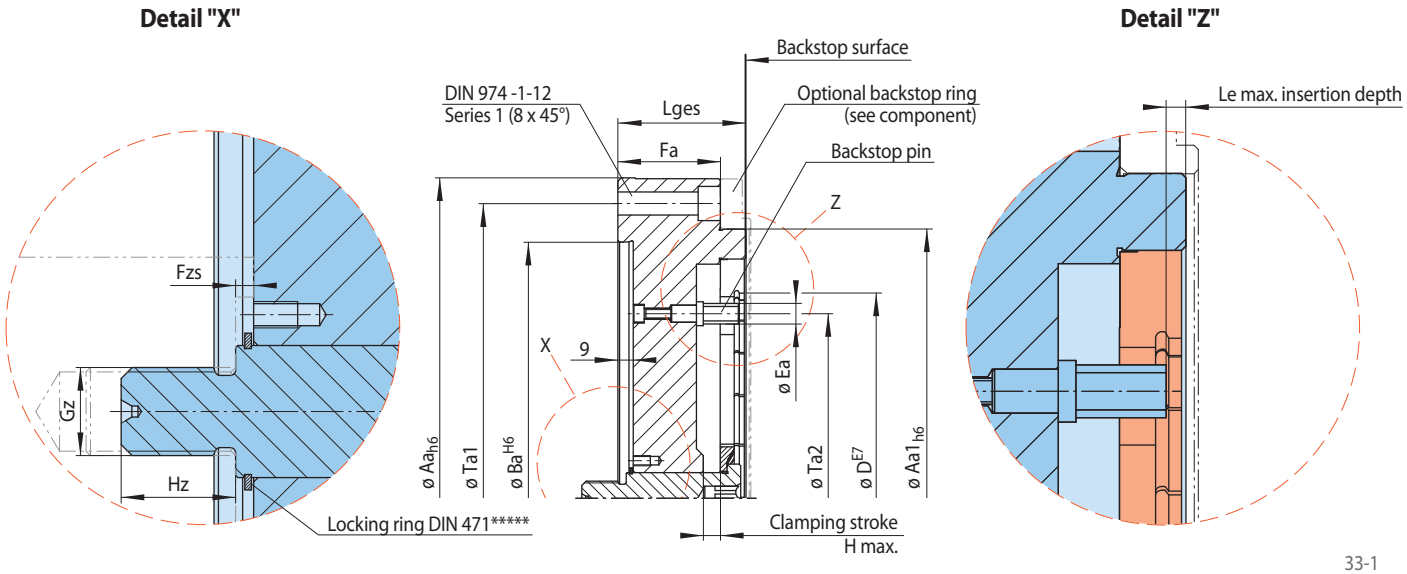


Clamping principle

The Flat Element sits pre-loaded in the seating diameter of the seating body. For clamping, the Flat Element is elastically deformed by the axial actuation force. The component is centred, pressed against the backstop and aligned flush.

Flat Element Flange Chucks KFFF

as Complete Clamping Fixture



33-1

Size	Achievable clamping diameter D* mm	Maximum diameter change** ΔD mm	Max. transmissible torque*** M[1] Nm	Max. Actuating force*** F N	Aa mm	Aa1 mm	Ba mm	Ea mm	Fa mm	Fsz mm	Gz	H max. mm	Hz mm	Le max. mm	Lges mm	Ta1 mm	Ta2 mm	Y ****
KFFF 110	90 - 100	0,27	550 - 610	14200	200	150	125	5,5	34,5	3,8	M 12	3,2	18	5	45,5	175	80,5	3
KFFF 120	100 - 110	0,27	680 - 740	14200	200	150	125	10	34,5	3,8	M 12	3,6	18	5	45,5	175	85,5	3
KFFF 130	110 - 120	0,30	730 - 780	13750	225	170	125	10	34,5	3,8	M 12	4,0	18	5	45,5	200	95,0	3
KFFF 140	120 - 130	0,33	780 - 840	13750	225	170	125	10	34,5	3,8	M 12	4,4	18	5	45,5	200	104	3
KFFF 155	130 - 140	0,36	1250 - 1300	19600	250	200	175	10	42,5	3,3	M 16	4,8	22	6	55,5	225	114	4
KFFF 170	140 - 155	0,40	1350 - 1500	19600	250	200	175	10	42,5	3,3	M 16	5,4	22	6	55,5	225	124	4
KFFF 185	155 - 170	0,46	1450 - 1600	19600	275	225	200	10	42,5	3,3	M 16	6,1	22	6	55,5	250	139	4
KFFF 200	170 - 185	0,50	1650 - 1750	19600	275	225	200	10	42,5	3,3	M 16	6,7	22	6	55,5	250	153	4
KFFF 220	185 - 200	0,56	1750 - 1850	18650	315	250	240	12	42,5	3,3	M 16	7,2	22	6	55,5	280	165	4
KFFF 240	200 - 220	0,50	2950 - 3350	29450	375	315	300	12	60,0	3,8	M 20	8,0	26	6	75,0	345	180	4
KFFF 260	220 - 240	0,66	3650 - 3900	33350	375	315	300	12	60,0	3,8	M 20	9,0	26	6	75,0	345	200	4
KFFF 280	240 - 260	0,73	4050 - 4350	34350	375	315	300	14	60,0	3,8	M 20	10,0	26	6	75,0	345	216	4

* Clamping diameter adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element. • *** for clamping with pull-back action. • **** Y = Number of backstop pins on pitch circle diameter Ta2. • ***** The locking ring prevents loss of the draw bolt during transport and storage of the Clamping Fixture. It must be removed prior to installation and commissioning.
[1] The lower value refers to the smallest clamping diameter of the respective size, the higher value to the largest. For values between the two can be determined through interpolation.

Example for ordering

Please indicate the size of the Clamping Fixture, the clamping diameter of your component, including component tolerance, and the insertion depth in your order:

Size:	KFFF 120
Clamping diameter:	105,47 mm
Component tolerance:	h6
Insertion depth:	2,8 mm

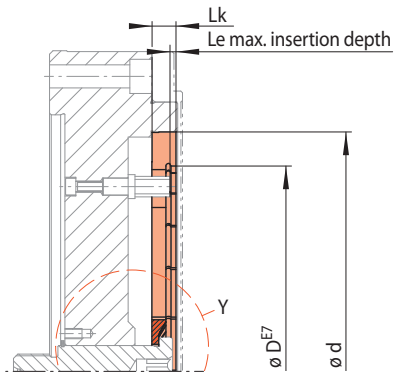
➡ KFFF 120-105,47h6-2,8

Customer assembly

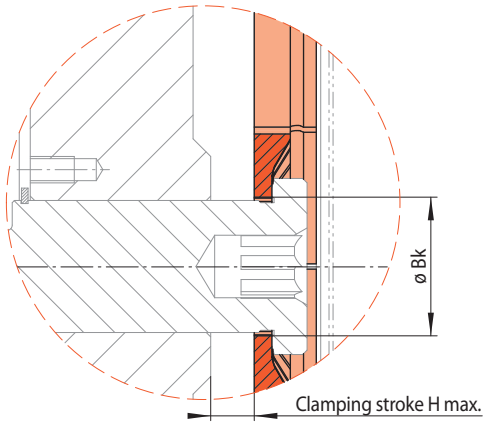
The Flat Elements and components shown on pages 34 to 36 are available for customer assembled Flat Element Flange Chucks..

Clamping Elements Flat Elements KFF

for customer assembled Flat Element Flange Chucks
for setup to different clamping diameters within a given size



Detail "Y"



34-1

Size KFF … d mm	Achievable clamping diameter D* mm	Maximum diameter change** Δ D mm	Max. transmissible torque*** M[1)] Nm	Max. Actuating force*** F N	Bk mm	H max. **** mm	Le max. mm	Lk mm	Art.-No. 1190-
42	30 - 36	0,15	20 - 24	2700	10,5	1,0	2	6	042002
47	35 - 41	0,15	54 - 61	5900	10,5	1,0	2	6	047002
52	40 - 46	0,15	69 - 78	5700	10,5	1,2	2	6	052002
62	45 - 54	0,20	120 - 140	9800	12,5	1,4	3	8	062002
70	52 - 62	0,20	155 - 185	9500	12,5	1,8	3	8	070002
80	62 - 72	0,21	215 - 245	9200	12,5	2,2	3	8	080002
90	72 - 80	0,21	280 - 310	8950	12,5	2,6	3	8	090002
100	80 - 90	0,27	440 - 490	14200	16,5	2,8	4	10	100002
110	90 - 100	0,27	550 - 610	14200	16,5	3,2	5	10	110002
120	100 - 110	0,27	680 - 740	14200	16,5	3,6	5	10	120002
130	110 - 120	0,30	730 - 780	13750	16,5	4,0	5	10	130002
140	120 - 130	0,33	780 - 840	13750	16,5	4,4	5	10	140002
155	130 - 140	0,36	1250 - 1300	19600	21,0	4,8	6	12	155002
170	140 - 155	0,40	1350 - 1500	19600	21,0	5,4	6	12	170002
185	155 - 170	0,46	1450 - 1600	19600	21,0	6,1	6	12	185002
200	170 - 185	0,50	1650 - 1750	19600	21,0	6,7	6	12	200002
220	185 - 200	0,56	1750 - 1850	18650	21,0	7,2	6	12	220002
240	200 - 220	0,50	2950 - 3350	29450	31,5	8,0	6	14	240002
260	220 - 240	0,66	3650 - 3900	33350	31,5	9,0	6	14	260002
280	240 - 260	0,73	4050 - 4350	34350	31,5	10,0	6	14	280002
300	260 - 280	0,74	4700 - 5050	34350	31,5	11,0	6	14	300002
325	280 - 300	0,74	4800 - 5200	29450	31,5	12,0	6	16	325002
350	300 - 325	0,74	5600 - 6100	29450	31,5	13,0	6	16	350002
375	325 - 350	0,74	6600 - 7150	29450	31,5	14,0	6	16	375002
400	350 - 375	0,86	6200 - 6700	29450	52,0	14,0	6	18	400002
425	375 - 400	0,86	7200 - 7700	29450	52,0	15,0	6	18	425002
455	400 - 425	0,86	8250 - 8750	29450	52,0	16,0	6	18	455002
485	425 - 455	0,98	6900 - 7400	24550	52,0	16,0	6	20	485002
520	455 - 485	0,98	7950 - 8450	24550	52,0	19,5	6	20	520002
560	485 - 520	0,98	9150 - 9850	24550	52,0	21,0	6	20	560002

* Clamping diameter adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element. • *** for clamping with pull-back action.
**** Clamping stroke H max. describes the load limit of the Clamping Element while activation without component.
[1)] The lower value refers to the smallest clamping diameter of the respective size, the higher value to the largest. For values between the two can be determined through interpolation.

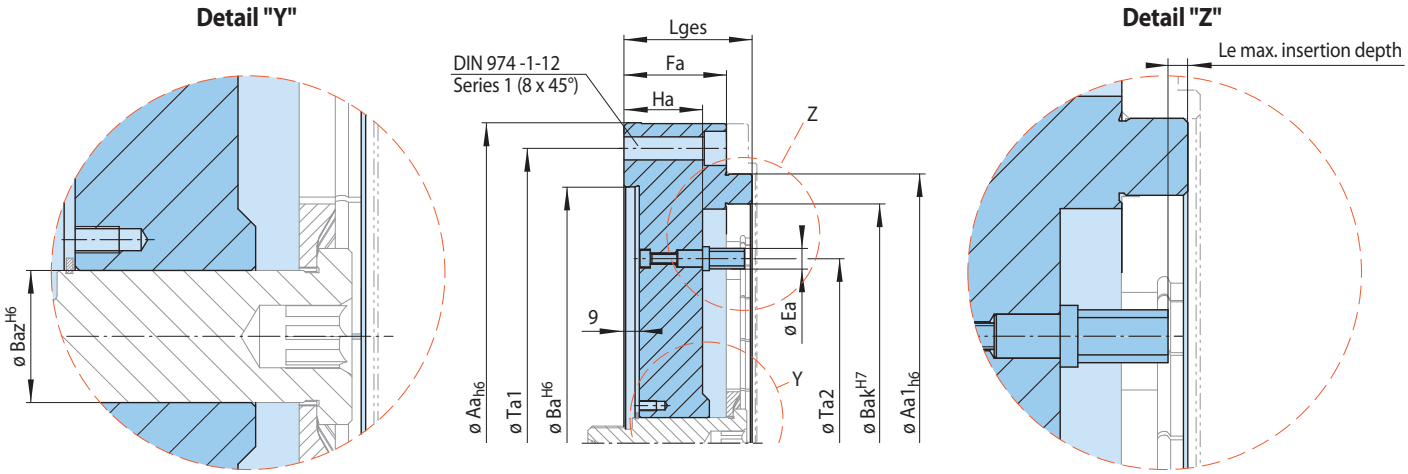
Example for ordering

Please indicate the size of the Clamping Element and the clamping diameter of your component, including component tolerance, in your order:

Size:	KFF 62
Clamping diameter:	50,47 mm
Component tolerance:	h6

➡ KFF 62-50,47h6

Seating body with backstop pins

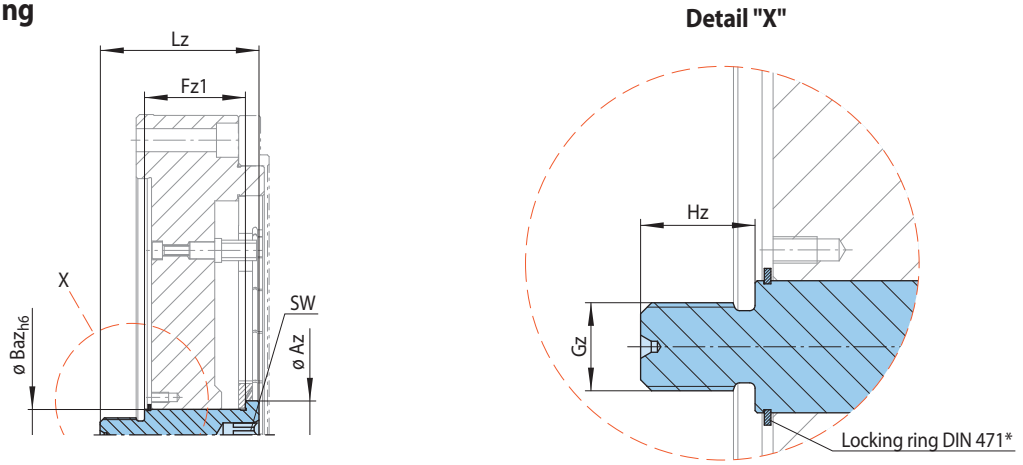


35-1

for size	Aa mm	Aa1 mm	Ba mm	Bak mm	Baz mm	Ea mm	Fa mm	Ha mm	Le max. mm	Lges mm	Ta1 mm	Ta2 mm	Art.-No.* 3173-
KFFF 110	200	150	125	110	16	5,5	34,5	29,3	5	45,5	175	80,5	110900
KFFF 120	200	150	125	120	16	10	34,5	28,9	5	45,5	175	85,5	120900
KFFF 130	225	170	125	130	16	10	34,5	28,5	5	45,5	200	95,0	130900
KFFF 140	225	170	125	140	16	10	34,5	28,1	5	45,5	200	104	140900
KFFF 155	250	200	175	155	20	10	42,5	33,7	6	55,5	225	114	155900
KFFF 170	250	200	175	170	20	10	42,5	33,1	6	55,5	225	124	170900
KFFF 185	275	225	200	185	20	10	42,5	32,4	6	55,5	250	139	185900
KFFF 200	275	225	200	200	20	10	42,5	31,8	6	55,5	250	153	200900
KFFF 220	315	250	240	220	20	12	42,5	31,3	6	55,5	280	165	220900
KFFF 240	375	315	300	240	30	12	60,0	48,0	6	75,0	345	180	240900
KFFF 260	375	315	300	260	30	12	60,0	47,0	6	75,0	345	200	260900
KFFF 280	375	315	300	280	30	14	60,0	46,0	6	75,0	345	216	280900

* Please indicate the insertion depth in your order.

Draw bolt with locking ring

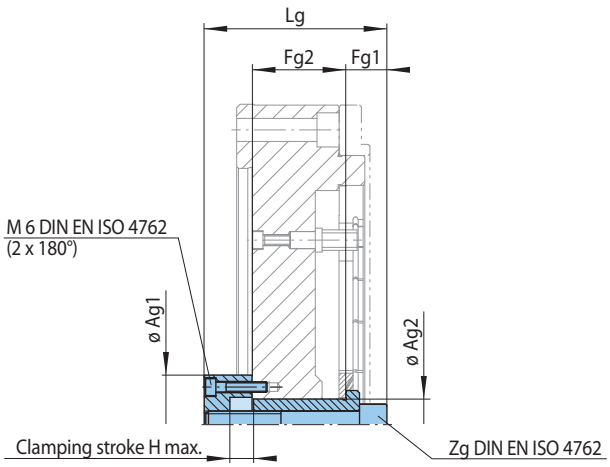


35-2

for size	Az mm	Baz mm	Fz1 mm	Gz	Hz mm	Lz mm	SW mm	Art.-No. 3186-
KFFF 110	22	16	32	M 12	18	56	8	022900
KFFF 120	22	16	32	M 12	18	56	8	022900
KFFF 130	22	16	32	M 12	18	56	8	022900
KFFF 140	22	16	32	M 12	18	56	8	022900
KFFF 155	28	20	40	M 16	22	69	10	028900
KFFF 170	28	20	40	M 16	22	69	10	028900
KFFF 185	28	20	40	M 16	22	69	10	028900
KFFF 200	28	20	40	M 16	22	69	10	028900
KFFF 220	28	20	40	M 16	22	69	10	028900
KFFF 240	40	30	59	M 20	26	93	14	040900
KFFF 260	40	30	59	M 20	26	93	14	040900
KFFF 280	40	30	59	M 20	26	93	14	040900

* The locking ring prevents loss of the draw bolt during transport and storage of the Clamping Fixture. It must be removed prior to installation and commissioning.

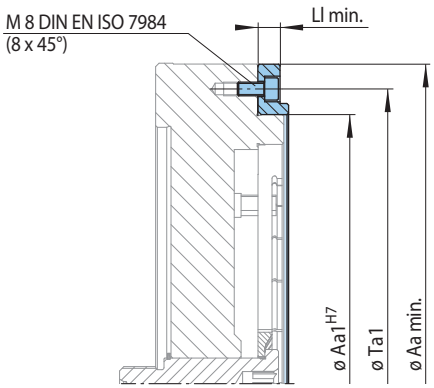
Assembly group for hand clamping (optional)



36-1

for size	Ag1 mm	Ag2 mm	Fg1 mm	Fg2 mm	H max. mm	Lg mm	Zg	Art.-No. 3182-
KFFF 110	43	16	16	27	3,2	59	M 10	022900
KFFF 120	43	16	16	27	3,6	59	M 10	022900
KFFF 130	43	16	16	27	4,0	59	M 10	022900
KFFF 140	43	16	16	27	4,4	59	M 10	022900
KFFF 155	48	20	19	35	4,8	79	M 12	028900
KFFF 170	48	20	19	35	5,4	79	M 12	028900
KFFF 185	48	20	19	35	6,1	79	M 12	028900
KFFF 200	48	20	19	35	6,7	79	M 12	028900
KFFF 220	48	20	19	35	7,2	79	M 12	028900
KFFF 240	58	30	24	54	8,0	106	M 16	040900
KFFF 260	58	30	24	54	9,0	106	M 16	040900
KFFF 280	58	30	24	54	10,0	106	M 16	040900

Backstop ring (optional)



36-2

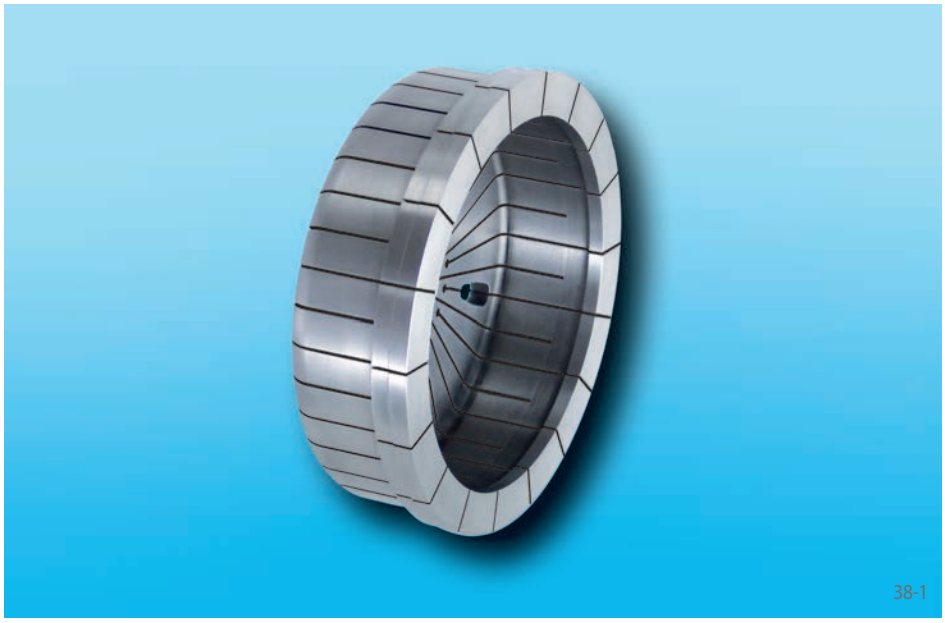
for size	Aa min. mm	Aa1 mm	Ll min. mm	Ta1 mm
KFFF 110	200	150	8	175
KFFF 120	200	150	8	175
KFFF 130	225	170	8	200
KFFF 140	225	170	8	200
KFFF 155	250	200	8	225
KFFF 170	250	200	8	225
KFFF 185	275	225	8	250
KFFF 200	275	225	8	250
KFFF 220	315	250	8	280
KFFF 240	375	315	8	345
KFFF 260	375	315	8	345
KFFF 280	375	315	8	345

Missing dimensions reflect component geometry.

Notes / sketches

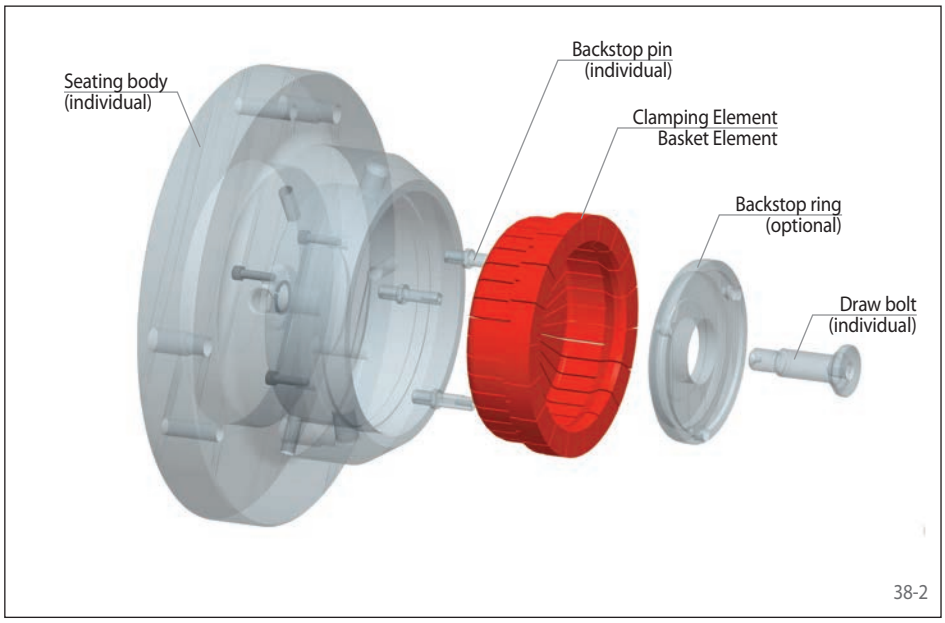
Clamping Elements Basket Elements KOF

for customer assembled Basket Element Clamping Chucks
for setup to different clamping diameters within a given size



Features

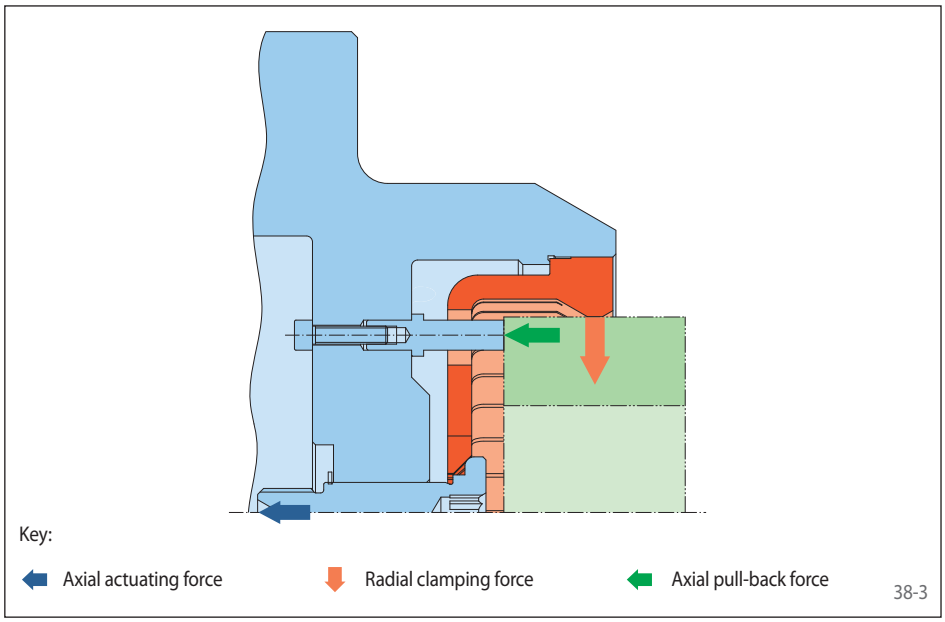
- For clamping diameters from 40 mm to 340 mm
- High true running accuracy ≤ 0,01 mm
- Permissible component tolerance IT11 up to IT13
- Short clamping fixture length
- Short clamping length
- Pull-back against individually designed internal backstop ring or backstop pins and external backstop surface
- Hand clamping optional possible
- Rubberized slots in the Basket Element



Configuration

The Clamping Element Basket Element is a adaptation from the Flat Element for extended insertion depths, e.g. when a backstop ring mounted on the backstop pin is used.

Basket Element Clamping Chucks are produced individually in accordance with customer specifications. To order this fixture, please complete the questionnaire on page 119 and send it to us.

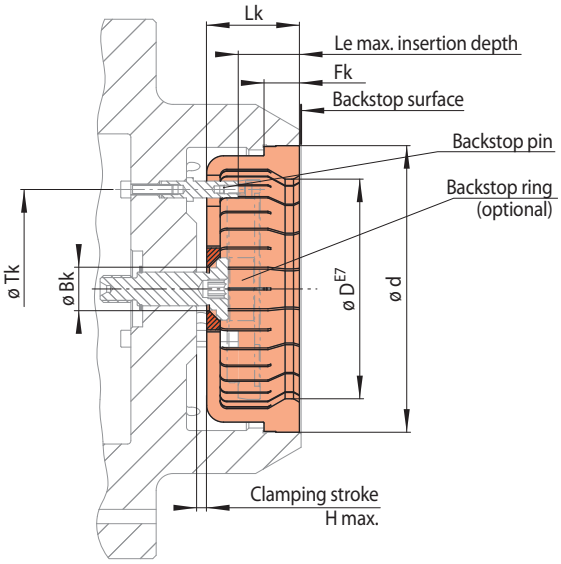


Clamping principle

The Basket Element sits pre-loaded in the seating diameter of the seating body. For clamping, the Basket Element is elastically deformed by an axial actuating force. The component is centred, pressed against the backstop and aligned flush.

Clamping Elements Basket Elements KOF

for customer assembled Basket Element Clamping Chucks for setup to different clamping diameters within a given size



39-1

Size KOF … d mm	Achievable clamping diameter D* mm	Maximum diameter change** Δ D mm	Max. transmissible torque*** M[1)] Nm	Max. Actuating force*** F N	Bk mm	Fk mm	H max. **** mm	Le max. mm	Lk mm	Tk mm	Y *****	Art.-No. 1191-
62	40 - 45	0,18	98 - 120	7350	17	7	2,8	16,5	23	36,5	4	062002
70	45 - 52	0,20	120 - 135	7350	17	8	3,1	18,5	25	40,5	4	070002
80	52 - 62	0,23	135 - 165	7350	17	10	3,6	20,5	27	47	4	080002
90	62 - 72	0,26	225 - 250	8850	17	10	4,0	23	30	55	4	090002
100	72 - 80	0,27	440 - 490	12750	22	10	4,6	26	34	62	4	100002
110	80 - 90	0,27	540 - 610	12750	22	10	5,0	28	36	70	4	110002
120	90 - 100	0,27	650 - 720	12750	22	10	5,4	28	36	80	4	120002
130	100 - 110	0,30	690 - 780	12750	22	11	5,8	28	36	90	4	130002
140	110 - 120	0,33	780 - 880	13250	22	12	6,2	28	36	100	3	140002
155	120 - 130	0,36	1700 - 1850	22550	26	13	7,8	38	48	108	3	155002
170	130 - 140	0,40	1800 - 1950	22550	26	14	8,8	38	48	118	3	170002
185	140 - 155	0,46	1800 - 2000	22550	26	14	9,3	38	48	128	3	185002
200	155 - 170	0,50	2000 - 2200	22550	26	15	9,6	38	48	141	3	200002
220	170 - 190	0,56	2100 - 2350	22550	26	15	10,0	38	48	154	3	220002
240	190 - 210	0,60	2400 - 2650	22550	26	16	11,0	38	48	173	4	240002
260	210 - 230	0,66	2650 - 2850	22550	26	16	12,6	48	58	193	4	260002
280	230 - 250	0,73	3050 - 3350	22550	26	16	14,3	48	58	213	4	280002
300	250 - 270	0,74	4600 - 4900	31400	27	18	12,0	48	58	233	4	300002
325	270 - 290	0,80	4900 - 5200	31400	27	18	12,5	48	59	252	6	325002
350	290 - 315	0,85	5100 - 5600	31400	27	20	14,0	48	59	272	6	350002
375	315 - 340	0,90	5600 - 6000	31400	27	20	15,0	48	59	297	6	375002

* Clamping diameter adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element. • *** for clamping with pull-back action.
**** Clamping stroke H max. describes the load limit of the Clamping Element while activation without component. • ***** Y = Number of long holes in the Basket Clamping Element on pitch circle diameter Tk
[1)] The lower value refers to the smallest clamping diameter of the respective size, the higher value to the largest. For values between the two can be determined through interpolation.

Example for ordering

Please indicate the size of the Clamping Element and the clamping diameter of your component, including component tolerance, in your order:

Size:	KOF 70
Clamping diameter:	50,47 mm
Component tolerance:	h6

➡ KOF 70-50,47h6

Maximum speed in rpm

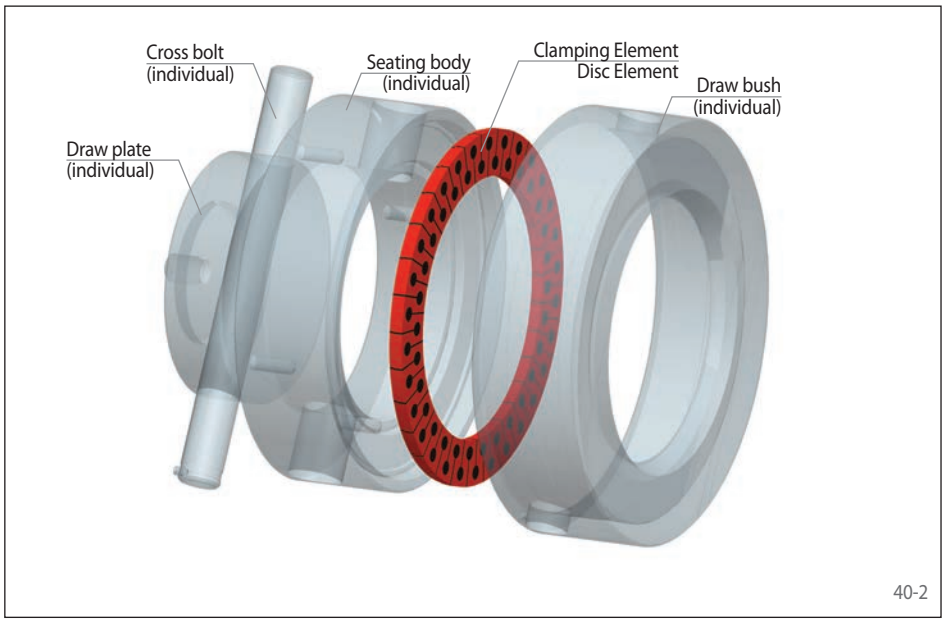
Basket Elements may be used up to a max. speed of 1000 min^{-1}.

Clamping Elements Disc Elements KAF

for customer assembled Disc Element Clamping Chucks for setup to different clamping diameters within a given size

Features

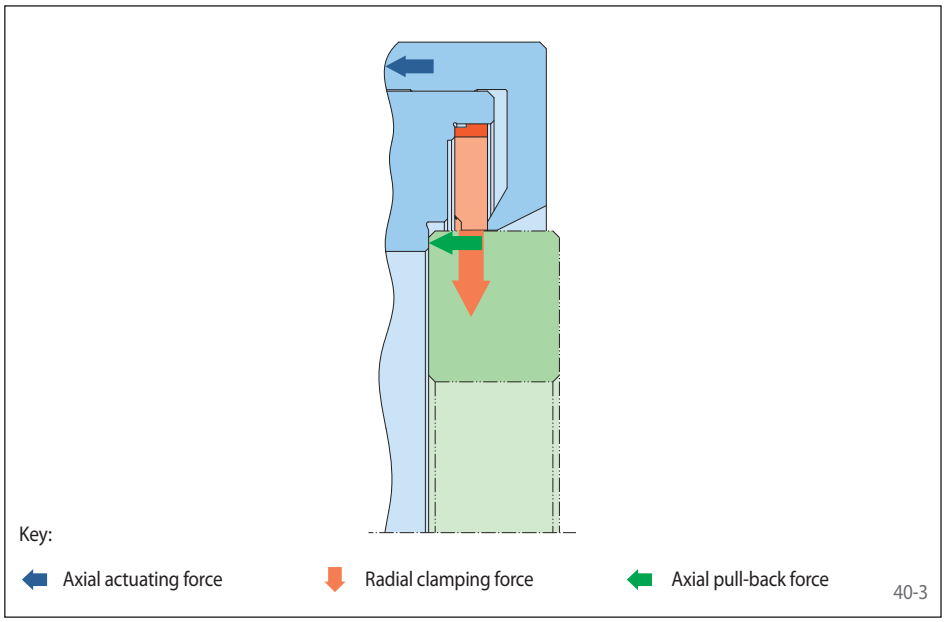
- For clamping diameters from 140 mm to 550 mm
- True running accuracy ≤ 0,02 mm
- Permissible component tolerance up to IT11
- Short clamping length
- Extended insertion depth
- Pull-back possible
- Rubberized slots in the Disc Element



Configuration

The Clamping Element Disc Element is an adaptation of the Clamping Element Bonded Disc Pack for large clamping diameters.

Disc Element Clamping Chucks are produced individually in accordance with customer specifications. To order this fixture, please complete the questionnaire on page 119 and send it to us.

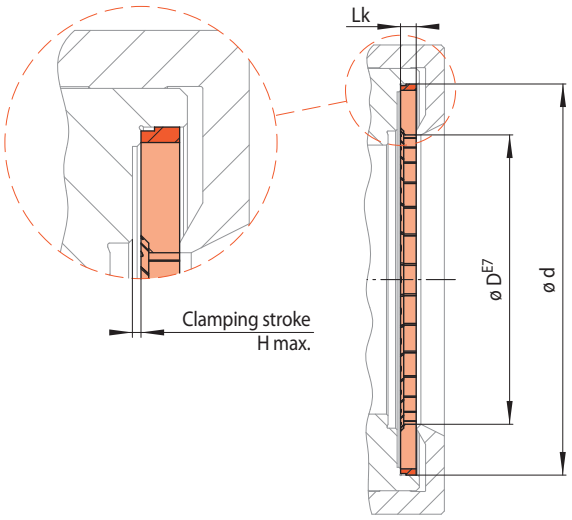


Clamping principle

The Disc Element sits pre-loaded in the seating diameter of the seating body. For clamping, the Disc Element is elastically deformed by an axial actuating force. The component is centred, pressed against the backstop and aligned flush.

Clamping Elements Disc Elements KAF

for customer assembled Disc Element Clamping Chucks for setup to different clamping diameters within a given size



41-1

Size KAF … d mm	Achievable clamping diameter D* mm	Maximum diameter change** Δ D mm	Max. transmissible torque*** M 1) Nm	Max. Actuating force with pull-back action Fm N	Max. Actuating force without pull-back action Fo N	H max. *** mm	Lk mm	Art.-No. 1195-
200	140 - 150	0,36	1300	51000	33000	1,8	8,5	200691
212	150 - 160	0,38	1550	55000	35500	1,9	8,5	212691
224	160 - 170	0,40	1750	60000	39000	2,0	8,5	224691
236	170 - 180	0,40	2000	62500	40000	2,1	10,0	236691
250	180 - 190	0,42	2300	67500	43000	2,2	10,0	250691
265	190 - 200	0,46	2600	71500	45500	2,4	10,0	265691
280	200 - 212	0,50	2800	76000	48500	2,6	10,0	280691
300	212 - 224	0,57	3200	82000	52500	2,8	12,5	300691
315	224 - 236	0,60	3700	88500	57000	3,0	12,5	315691
335	236 - 250	0,63	4100	91500	58500	3,2	12,5	335691
355	250 - 265	0,66	4600	96500	61500	3,4	12,5	355691
375	265 - 280	0,70	5200	103000	65500	3,7	16,0	375691
400	280 - 300	0,72	5800	106500	67500	3,9	16,0	400691
425	300 - 315	0,80	6800	118000	74000	4,3	16,0	425691
450	315 - 335	0,90	7500	124500	74000	4,9	16,0	450691
475	335 - 365	0,90	8500	129000	78500	4,9	18,0	475691
500	365 - 400	0,90	10000	151500	96000	4,9	18,0	500691
525	400 - 425	0,90	12100	175000	114500	4,4	18,0	525691
550	425 - 450	0,90	13500	186000	121500	4,4	18,0	550691
575	450 - 475	0,90	15000	196500	128500	4,4	18,0	575691
600	475 - 500	0,90	17000	207500	136000	4,4	18,0	600691

* Clamping diameter adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element.
*** Clamping stroke H max. describes the load limit of the Clamping Element while activation without component.

Example for ordering

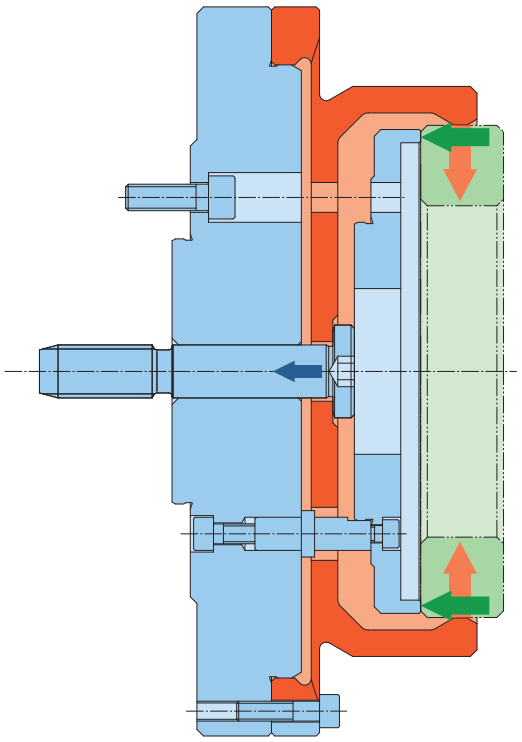
Please indicate the size of the Clamping Element and the clamping diameter of your component, including component tolerance, in your order:

Size:	KAF 300
Clamping diameter:	220,47 mm
Component tolerance:	h6

➡ KAF 300-220,47h6

Clamping principles for customized Clamping Chucks

Segmented Diaphragm Clamping Chucks and Unslottted Diaphragm Clamping Chucks



Segmented Diaphragm Clamping Chuck

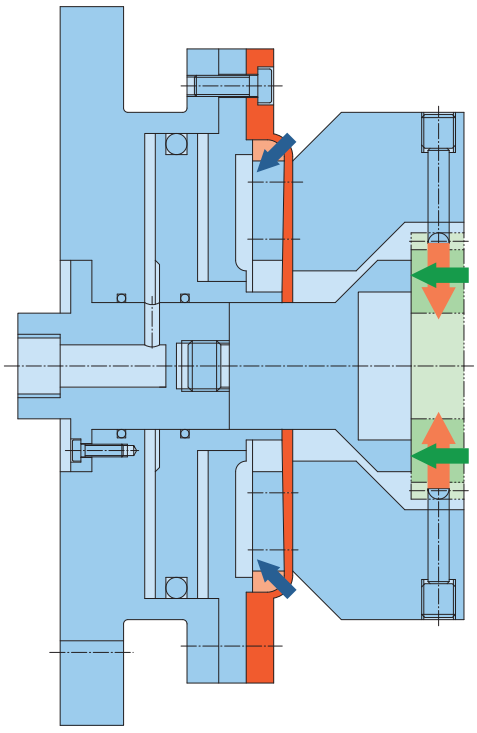
Key:

Axial actuating force | Radial clamping force | Axial pull-back force

42-1

Features Segmented Diaphragm Clamping Chucks

- For clamping diameters from 160 mm to 1 600 mm
- True running accuracy ≤ 0,01 mm up to clamping diameter of 500 mm
- Very high repeating accuracy ≤ 0,005 mm
- Permissible component tolerance up to IT13
- Short clamping fixture length
- Short clamping length
- Extended insertion depth
- Pull-back possible
- For thin-walled or solid components
- Hand clamping optional possible
- Virtually wear-free due to elastic deformation during the clamping process. Thus guarantees very long service life
- Clamping with intrinsic spring force is also possible
- Maximum possible rigidity of the entire machine-tool/clamping-fixture system due to the short clamping fixture length
- Suitable especially for turbine stage clamping



Unslotted Diaphragm Clamping Chuck

Key:

Axial actuating force | Radial clamping force | Axial pull-back force

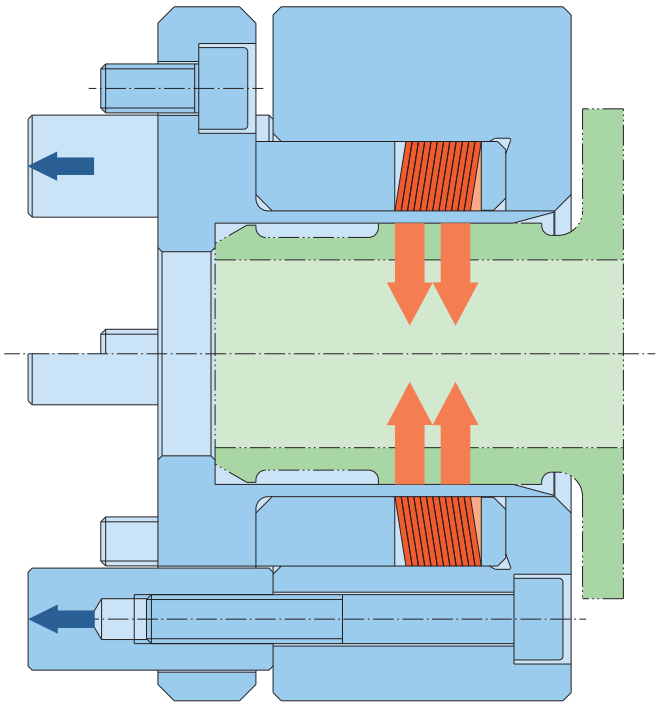
42-2

Features Unslotted Diaphragm Clamping Chucks

- For clamping diameters from 20 mm to 250 mm
- True running accuracy ≤ 0,01 mm
- Maximum repeating accuracy ≤ 0,003 mm
- Permissible component tolerance up to IT7
- Short clamping length
- Extended insertion depth
- Pull-back possible
- Virtually wear-free due to elastic deformation during the clamping process. Thus guarantees very long service life
- Clamping with intrinsic spring force is also possible
- Maximum possible rigidity of the entire machine-tool/clamping-fixture system due to the short clamping fixture length
- Suitable especially for gear wheel clamping in pitch line

Clamping principles for customized Clamping Chucks

Disc Actuated Bush Clamping Chucks



Disc Actuated Bush Clamping Chuck

Key:

Axial actuating force

Radial clamping force

43-1

Features

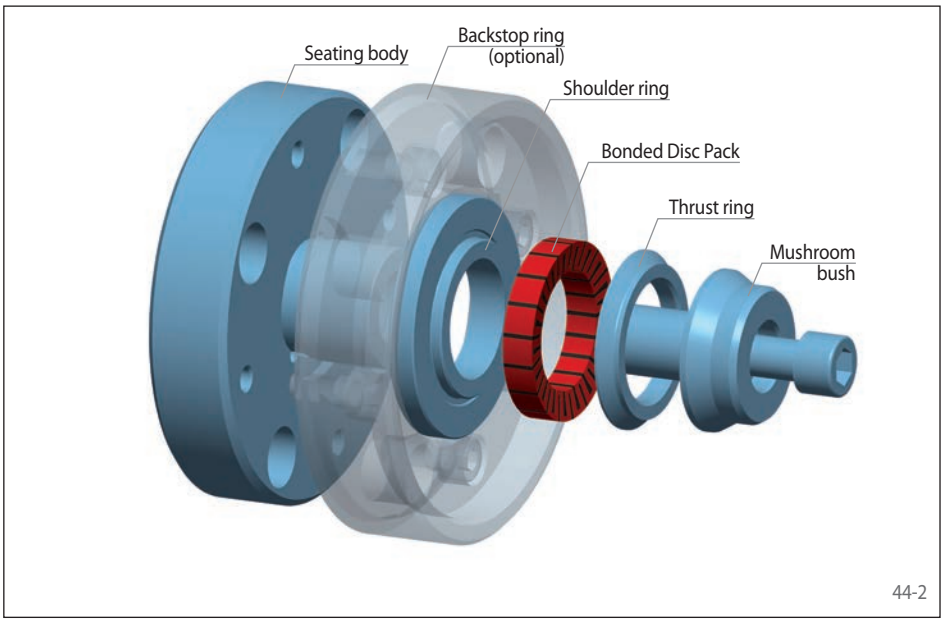
- For clamping diameters from 5 mm to 166 mm
- Very high true running accuracy ≤ 0,005 mm
- Maximum repeating accuracy ≤ 0,003 mm
- Permissible component tolerance up to IT9
- Short or long clamping length possible
- Virtually wear-free due to elastic deformation during the clamping process. Thus guarantees very long service life
- In contrast to Hydraulic Expanding Clamping Chucks, interruptions, e.g. keyways, are permissible in the component clamping diameter

Bonded Disc Pack Flange Mandrels LBDF

as Complete Clamping Fixture

Features

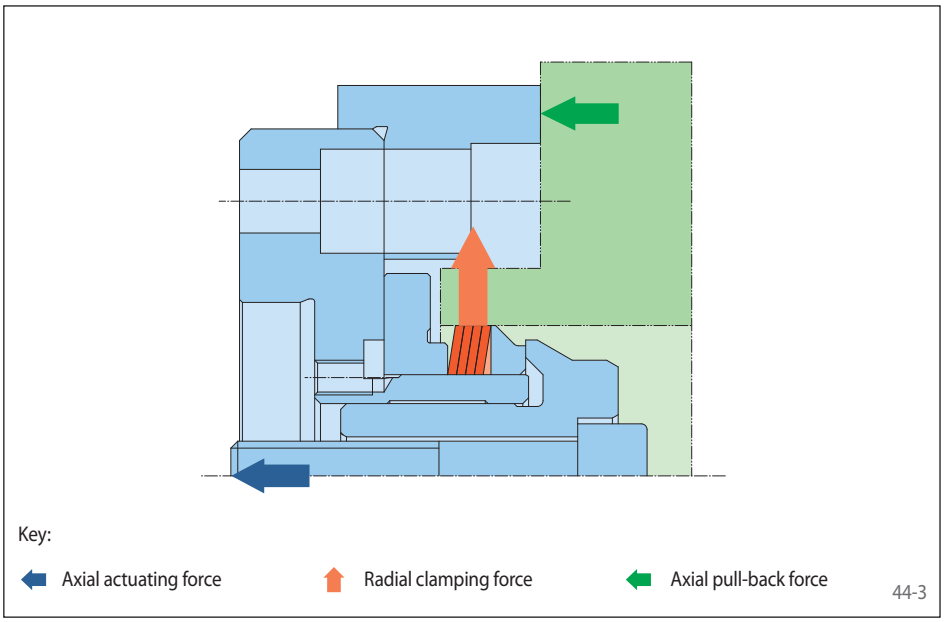
- For clamping diameters from 18 mm to 140 mm
- High true running accuracy ≤ 0,01 mm
- Permissible component tolerance up to IT11
- Short or long clamping length possible
- Pull-back against external backstop surface or optional, individually designed external backstop ring
- For thin-walled or solid components
- Hand clamping optional possible
- Impervious to ingress of foreign objects due to the rubberized slots in the Bonded Disc Pack



Configuration

The Bonded Disc Pack Flange Mandrel consists of a seating body, a shoulder ring, a Bonded Disc Pack, a thrust ring and a mushroom bush. A backstop ring and a plate with a threaded bore are optionally available for hand clamping. The Bonded Disc Pack Flange Mandrel is attached to the machine with the seating body. The Clamping Fixture is actuated by the central bolt of the mushroom bush, which is connected to the machine power actuating unit. Depending on the required transmitted torque, Bonded Disc Packs of different widths may be installed. The required installation configurations for the shoulder ring are shown in Fig. 45-2.

Intermediate Flanges and Spring Force Actuators are shown starting on page 86.

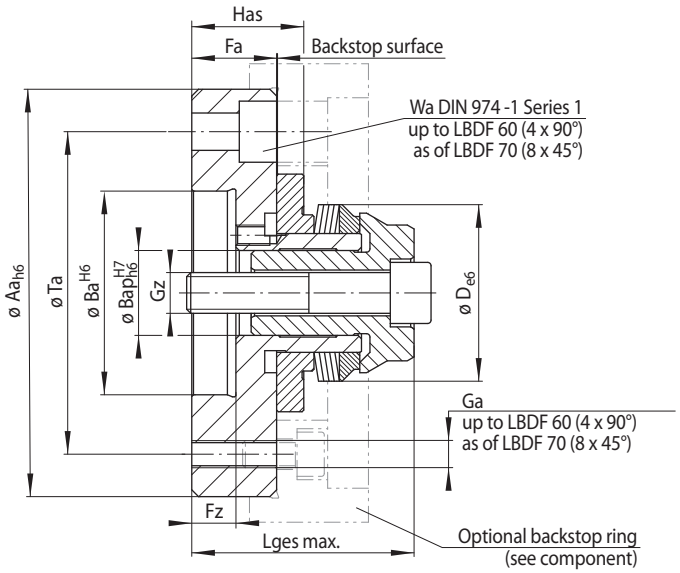


Clamping principle

The Bonded Disc Pack sits pre-loaded on the seating diameter of the seating body. When axial actuating force is applied, the Bonded Disc Pack is raised to an upright position. The component is centred, pressed against the shoulder ring or the backstop and aligned flush. The tipping movement of the Bonded Disc Pack converts the axial actuating force into a radial clamping force that is up to ten times higher.

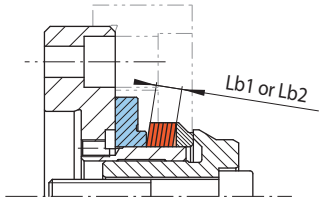
Bonded Disc Pack Flange Mandrels LBDF

as Complete Clamping Fixture

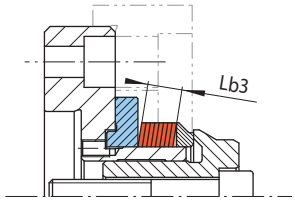


45-1

Installation situations



Bonded disc pack widths Lb1 and Lb2



Bonded disc pack width Lb3

45-2

Size	Achievable clamping diameter	Maximum diameter change**	Bonded disc pack width Lb1			Bonded disc pack width Lb2			Bonded disc pack width Lb3			Aa	Ba	Bap	Fa	Fz	Ga	Gz	Has	Lges max.	Ta	Wa
	D* mm	Δ D mm	Lb1 mm	M Nm	Fm kN	Lb2 mm	M Nm	Fm kN	Lb3 mm	M Nm	Fm kN	mm	mm	mm	mm	mm			mm	mm	mm	
LBDF 11	18 - 22	0,10	4	7	3,1	6	11	4,7	8	15	6,3	70	37	8	20	9	M 6	M 5	25	47	50	8
LBDF 15	22 - 27	0,10	4	15	4,5	6	22	6,8	8	29	9,1	90	50	10	20	9	M 6	M 6	29,5	54	70	8
	27 - 32	0,15	6	22	7,0	9	33	10,5	12	40	14,0	90	50	10	20	9	M 6	M 6	29,5[1)]	55	70	8
	32 - 37	0,15	6	20	6,0	9	30	9,0	12	40	12,0	90	50	10	20	9	M 6	M 6	29,5[1)]	55	70	8
LBDF 20	32 - 37	0,15	6	39	9,6	9	50	14,4	12	60	19,2	90	50	15	20	9	M 6	M 8	28	57	70	8
	37 - 42	0,15	6	38	8,4	9	50	12,6	12	60	16,8	90	50	15	20	9	M 6	M 8	28	57	70	8
LBDF 25	37 - 42	0,15	6	60	12,0	9	90	18,0	12	120	24,0	90	50	18	25	11	M 6	M 10	34	67	70	8
	42 - 47	0,15	6	60	10,8	9	90	16,2	12	120	21,6	90	50	18	25	11	M 6	M 10	34	67	70	8
LBDF 30	42 - 47	0,15	6	80	14,4	9	130	21,6	12	170	28,8	120	60	20	27	13	M 8	M 12	35	69	95	10
	47 - 52	0,15	6	80	12,8	9	120	19,2	12	160	25,6	120	60	20	27	13	M 8	M 12	35	69	95	10
LBDF 35	47 - 52	0,15	6	120	17,2	9	190	25,8	12	250	34,4	120	60	20	25	13	M 8	M 12	33	69	95	10
	52 - 57	0,15	6	120	15,6	9	180	23,4	12	240	31,2	120	60	20	25	13	M 8	M 12	33	69	95	10
LBDF 40	52 - 57	0,15	6	160	19,6	9	250	29,4	12	330	39,2	120	60	25	30	13	M 8	M 12	41	73	95	10
	57 - 62	0,15	6	160	18,4	9	240	27,6	12	320	36,8	120	60	25	30	13	M 8	M 12	41	73	95	10
LBDF 45	57 - 62	0,15	6	210	22,4	9	320	33,6	12	420	44,8	120	60	30	35	16	M 8	M 16	48	84	95	10
	62 - 67	0,15	6	200	20,8	9	310	31,2	12	410	41,6	120	60	30	35	16	M 8	M 16	48	84	95	10
LBDF 50	62 - 67	0,15	6	260	25,6	9	390	38,4	12	520	51,2	140	60	35	30	16	M 8	M 16	40,5	79	115	12
	67 - 70	0,15	6	250	23,2	9	380	34,8	12	500	46,4	140	60	35	30	16	M 8	M 16	40,5	79,5	115	12
	70 - 75	0,25	6	250	24,0	10	430	40,0	16	680	64,0	140	60	35	30	16	M 8	M 16	40,5[1)]	80	115	12
	75 - 80	0,25	6	250	22,8	10	420	38,0	16	670	60,8	140	60	35	30	16	M 8	M 16	40,5[1)]	80	115	12
LBDF 60	80 - 85	0,25	6	370	29,4	10	630	49,0	16	1 000	78,4	160	90	40	35	16	M 8	M 16	49	96,5	135	12
	85 - 90	0,25	6	370	27,6	10	620	46,0	16	990	73,6	160	90	40	35	16	M 8	M 16	49	96,5	135	12
LBDF 70	90 - 95	0,25	6	510	34,8	10	860	58,0	16	1 370	92,8	160	90	45	37	16	M 8	M 16	52,5	101	135	12
	95 - 100	0,25	6	510	33,0	10	850	55,0	16	1 360	88,0	160	90	45	37	16	M 8	M 16	52,5	101	135	12
LBDF 80	100 - 105	0,25	6	660	39,6	10	1 100	66,0	16	1 760	105,6	185	125	50	45	14	M 8	M 20	69,5	121	160	12
	105 - 110	0,25	6	660	38,4	10	1 100	64,0	16	1 760	102,4	185	125	50	45	14	M 8	M 20	69,5	121	160	12
LBDF 90	110 - 115	0,25	6	840	45,6	10	1400	76,0	16	2 240	121,6	185	125	60	45	14	M 8	M 20	70	120,5	160	12
	115 - 120	0,25	6	840	43,2	10	1400	72,0	16	2 240	115,2	185	125	60	45	14	M 8	M 20	70	120,5	160	12
LBDF 100	120 - 125	0,25	6	1 080	51,0	10	1 800	85,0	16	2 880	136,0	200	125	60	45	14	M 8	M 20	66	124	175	12
	125 - 130	0,25	6	1 080	48,6	10	1 800	81,0	16	2 880	129,6	200	125	60	45	14	M 8	M 20	66	124,5	175	12
	130 - 140	0,35	6,3	950	43,9	10	1 520	69,7	20	3 040	139,4	200	125	60	45	14	M 8	M 20	66	126,5	175	12

* Clamping diameter from > up to ≤ adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element.

[1)] A number of different shoulder rings are available for sizes LBDF 15 and LBDF 50, regardless of clamping diameter. Consequently, when using Bonded Disc Pack widths of Lb2 and Lb3, dimension Has is reduced by 2,5 mm with LBDF 15 and by 2 mm with LBDF 50.

Key

D = Achievable clamping diameter
Δ D = Maximum diameter change of the clamping diameter of the Clamping Element
Lb = Bonded disc pack width
M = Max. transmissible torque
Fm = Required actuating force for component clamping with pull-back action

Example for ordering

Please indicate the size of the Clamping Fixture and the clamping diameter of your component, including component tolerance, and the desired bonded disc pack width in your order:

Size:	LBDF 11
Clamping diameter:	21,47 mm
Component tolerance:	H7
Bonded disc pack width:	4 mm

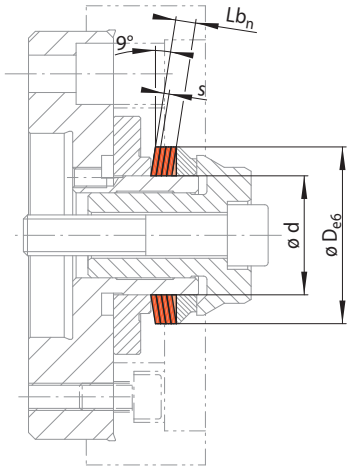
➡ LBDF 11-21,47H7-4

Customer assembly

The Bonded Disc Packs and components shown on pages 46 to 51 are available for customer assembled Bonded Disc Pack Flange Mandrels.

Clamping Elements Bonded Disc Packs LBD

for customer assembled Bonded Disc Pack Flange Mandrels for setup to different clamping diameters within a given size

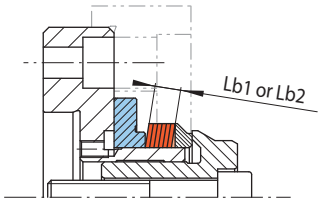


46-1

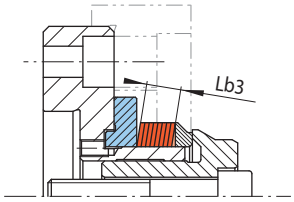
Key

d = Seating diameter
D = Achievable clamping diameter
Δ D = Maximum diameter change of the clamping diameter of the Clamping Element
s = Clamping disc thickness
n = Number of Clamping Discs (max. 16)
Lb$_n$ = s • n
= Bonded disc pack width
M$_n$ = M$_1$ • n
= Max. transmissible torque
Fm$_n$ = Fm$_1$ • n
= Required actuating force for component clamping with pull-back action
Fo$_n$ = Fo$_1$ • n
= Required actuating force for component clamping without pull-back action

Installation situations



Bonded disc pack widths Lb1 and Lb2



Bonded disc pack width Lb3

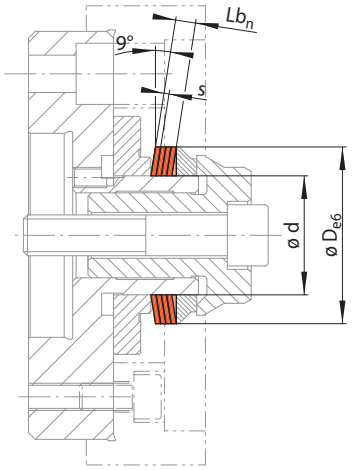
46-2

Size LBD …			Clamping Discs LBD					Bonded Disc Packs LBD														
								Bonded disc pack width Lb1					Bonded disc pack width Lb2					Bonded disc pack width Lb3				
d	D*	Δ D	s	M$_1$	Fm$_1$	Fo$_1$	Art.-No.	Lb1	M$_n$	Fm$_n$	Fo$_n$	Art.-No.	Lb2	M$_n$	Fm$_n$	Fo$_n$	Art.-No.	Lb3	M$_n$	Fm$_n$	Fo$_n$	Art.-No.
mm	mm	mm	mm	Nm	N	N	1001-	mm	Nm	N	N	3021-	mm	Nm	N	N	3021-	mm	Nm	N	N	3021-
11	18 - 22	0,10	0,5	0,9	380	260	011001	4	7	3100	2100	011001	6	11	4700	3200	011002	8	15	6300	4300	011003
15	22 - 27	0,10	0,5	1,8	560	390	015001	4	15	4500	3200	015001	6	22	6800	4800	015002	8	29	9100	6400	015003
	27 - 32	0,15	0,75	2,7	870	630	015004	6	22	7000	5100	015004	9	33	10500	7700	015005	12	40	14000	10300	015006
	32 - 37	0,15	0,75	2,5	740	510	015007	6	20	6000	4100	015007	9	30	9000	6200	015008	12	40	12000	8300	015009
20	32 - 37	0,15	0,75	4,9	1200	890	020001	6	39	9600	7200	020001	9	50	14400	10800	020002	12	60	19200	14400	020003
	37 - 42	0,15	0,75	4,7	1050	730	020004	6	38	8400	5900	020004	9	50	12600	8900	020005	12	60	16800	11900	020006
25	37 - 42	0,15	0,75	7,9	1500	1100	025001	6	60	12000	8800	025001	9	90	18000	13200	025002	12	120	24000	17600	025003
	42 - 47	0,15	0,75	7,5	1350	930	025004	6	60	10800	7500	025004	9	90	16200	11300	025005	12	120	21600	15100	025006
30	42 - 47	0,15	0,75	11	1800	1300	030001	6	80	14400	10400	030001	9	130	21600	15600	030002	12	170	28800	20800	030003
	47 - 52	0,15	0,75	10	1600	1100	030004	6	80	12800	8800	030004	9	120	19200	13200	030005	12	160	25600	17600	030006
35	47 - 52	0,15	0,75	16	2150	1550	035001	6	120	17200	12400	035001	9	190	25800	18600	035002	12	250	34400	24800	035003
	52 - 57	0,15	0,75	15	1950	1350	035004	6	120	15600	10800	035004	9	180	23400	16200	035005	12	240	31200	21600	035006
40	52 - 57	0,15	0,75	21	2450	1750	040001	6	160	19600	14000	040001	9	250	29400	21000	040002	12	330	39200	28000	040003
	57 - 62	0,15	0,75	20	2300	1550	040004	6	160	18400	12400	040004	9	240	27600	18600	040005	12	320	36800	24800	040006
45	57 - 62	0,15	0,75	27	2800	2000	045001	6	210	22400	16000	045001	9	320	33600	24000	045002	12	420	44800	32000	045003
	62 - 67	0,15	0,75	26	2600	1600	045004	6	200	20800	12800	045004	9	310	31200	19200	045005	12	410	41600	25600	045006
50	62 - 67	0,15	0,75	33	3200	2250	050001	6	260	25600	18000	050001	9	390	38400	27000	050002	12	520	51200	36000	050003
	67 - 70	0,15	0,75	32	2900	2000	050004	6	250	23200	16000	050004	9	380	34800	24000	050005	12	500	46400	32000	050006
55	67 - 70	0,15	0,75	40	3500	2500	055001	6	320	28000	20000	055001	9	480	42000	30000	055002	12	640	56000	40000	055003
50	70 - 75	0,25	1,0	43	4000	2900	050007	6	250	24000	17400	050007	10	430	40000	29000	050008	16	680	64000	46400	050009
	75 - 80	0,25	1,0	42	3800	2600	050010	6	250	22800	15600	050010	10	420	38000	26000	050011	16	670	60800	41600	050012
55	75 - 80	0,25	1,0	52	4500	3200	055004	6	310	27000	19200	055004	10	520	45000	32000	055005	16	830	72000	51200	055006
	80 - 85	0,25	1,0	51	4200	2900	055007	6	300	25200	17400	055007	10	510	42000	29000	055008	16	810	67200	46400	055009
60	80 - 85	0,25	1,0	63	4900	3500	060001	6	370	29400	21000	060001	10	630	49000	35000	060002	16	1000	78400	56000	060003
	85 - 90	0,25	1,0	62	4600	3200	060004	6	370	27600	19200	060004	10	620	46000	32000	060005	16	990	73600	51200	060006
65	85 - 90	0,25	1,0	74	5300	3800	065001	6	440	31800	22800	065001	10	740	53000	38000	065002	16	1180	84800	60800	065003
	90 - 95	0,25	1,0	73	5000	3500	065004	6	430	30000	21000	065004	10	730	50000	35000	065005	16	1160	80000	56000	065006
70	90 - 95	0,25	1,0	86	5800	4100	070001	6	510	34800	24600	070001	10	860	58000	41000	070002	16	1370	92800	65600	070003
	95 - 100	0,25	1,0	85	5500	3800	070004	6	510	33000	22800	070004	10	850	55000	38000	070005	16	1360	88000	60800	070006
75	95 - 100	0,25	1,0	99	6200	4400	075001	6	590	37200	26400	075001	10	990	62000	44000	075002	16	1580	99200	70400	075003
	100 - 105	0,25	1,0	98	5900	4000	075004	6	580	35400	24000	075004	10	980	59000	40000	075005	16	1560	94400	64000	075006
80	100 - 105	0,25	1,0	110	6600	4700	080001	6	660	39600	28200	080001	10	1100	66000	47000	080002	16	1760	105600	75200	080003
	105 - 110	0,25	1,0	110	6400	4400	080004	6	660	38400	26400	080004	10	1100	64000	44000	080005	16	1760	102400	70400	080006

* Clamping diameter from > up to ≤ adjustable to two places after the decimal point

Clamping Elements Bonded Disc Packs LBD

for customer assembled Bonded Disc Pack Flange Mandrels for setup to different clamping diameters within a given size

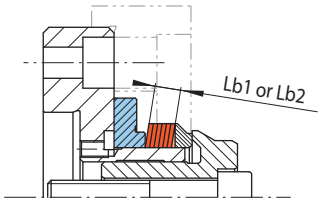


47-1

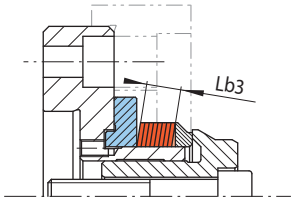
Key

d = Seating diameter
D = Achievable clamping diameter
Δ D = Maximum diameter change of the clamping diameter of the Clamping Element
s = Clamping disc thickness
n = Number of Clamping Discs (max. 16)
Lb$_n$ = s • n
= Bonded disc pack width
M$_n$ = M$_1$ • n
= Max. transmissible torque
Fm$_n$ = Fm$_1$ • n
= Required actuating force for component clamping with pull-back action
Fo$_n$ = Fo$_1$ • n
= Required actuating force for component clamping without pull-back action

Installation situations



Bonded disc pack widths Lb1 and Lb2



Bonded disc pack width Lb3

47-2

Size LBD …			Clamping Discs LBD					Bonded Disc Packs LBD													
								Bonded disc pack width Lb1					Bonded disc pack width Lb2					Bonded disc pack width Lb3			
d	D*	Δ D	s	M$_1$	Fm$_1$	Fo$_1$	Art.-No.	Lb1	M$_n$	Fm$_n$	Fo$_n$	Art.-No.	Lb2	M$_n$	Fm$_n$	Fo$_n$	Art.-No.	Lb3	M$_n$	Fm$_n$	Fo$_n$	Art.-No.
mm	mm	mm	mm	Nm	N	N	1001-	mm	Nm	N	N	3021-	mm	Nm	N	N	3021-	mm	Nm	N	N	3021-
85	105 - 110	0,25	1,0	130	7100	5100	085001	6	780	42600	30600	085001	10	1300	71000	51000	085002	16	2080	113600	81600	085003
	110 - 115	0,25	1,0	130	6800	4700	085004	6	780	40800	28200	085004	10	1300	68000	47000	085005	16	2080	108800	75200	085006
90	110 - 115	0,25	1,0	140	7600	5400	090001	6	840	45600	32400	090001	10	1400	76000	54000	090002	16	2240	121600	86400	090003
	115 - 120	0,25	1,0	140	7200	5000	090004	6	840	43200	30000	090004	10	1400	72000	50000	090005	16	2240	115200	80000	090006
95	115 - 120	0,25	1,0	160	8100	5700	095001	6	960	48600	34200	095001	10	1600	81000	57000	095002	16	2560	129600	91200	095003
	120 - 125	0,25	1,0	160	7700	5300	095004	6	960	46200	31800	095004	10	1600	77000	53000	095005	16	2560	123200	84800	095006
100	120 - 125	0,25	1,0	180	8500	6000	100001	6	1080	51000	36000	100001	10	1800	85000	60000	100002	16	2880	136000	96000	100003
	125 - 130	0,25	1,0	180	8100	5600	100004	6	1080	48600	33600	100004	10	1800	81000	56000	100005	16	2880	129600	89600	100006
	130 - 140	0,35	1,25	190	8700	6200	100007	6,3	950	43900	31300	100007	10	1520	69700	49700	100008	20	3040	139400	99400	100009
105	130 - 140	0,35	1,25	220	9600	7000	105004	6,3	1100	48400	35300	105004	10	1760	76900	56100	105005	20	3520	153800	112200	105006
115	140 - 150	0,35	1,25	260	10600	7700	115001	6,3	1310	53500	38900	115001	10	2080	85000	61800	115002	20	4160	170000	123600	115003
	150 - 160	0,35	1,25	260	10000	7000	115004	6,3	1310	50400	35300	115004	10	2080	80000	56100	115005	20	4160	160000	112200	115006
125	150 - 160	0,35	1,25	320	11800	8600	125001	6,3	1610	59500	43400	125001	10	2560	94500	68900	125002	20	5120	189000	137800	125003
135	160 - 170	0,35	1,25	370	12800	9300	135001	6,3	1860	64600	46900	135001	10	2960	102600	74500	135002	20	5920	205200	149000	135003
	170 - 180	0,35	1,25	370	12000	8400	135004	6,3	1860	60500	42400	135004	10	2960	96100	67400	135005	20	5920	192200	134800	135006
145	170 - 180	0,35	1,25	430	14000	10200	145001	6,3	2160	70600	51500	145001	10	3440	112100	81800	145002	20	6880	224200	163600	145003
155	180 - 190	0,35	1,25	500	14900	10700	155001	6,3	2520	75100	54000	155001	10	4000	119300	85800	155002	20	8000	238600	171600	155003
	190 - 200	0,35	1,25	500	14000	9700	155004	6,3	2520	70600	48900	155004	10	4000	112100	77700	155005	20	8000	224200	155400	155006

* Clamping diameter from > up to ≤ adjustable to two places after the decimal point

Example for ordering

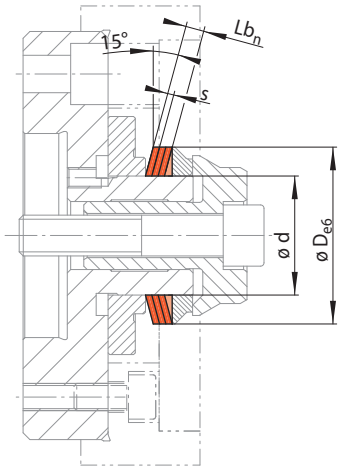
Please indicate the size of the Clamping Element, the clamping diameter of your component, including component tolerance, and the desired bonded disc pack width in your order:

Size:	LBD 11
Clamping diameter:	21,47 mm
Component tolerance:	H7
Bonded disc pack width:	4 mm

➡ LBD 11-21,47 H7-4

Clamping Elements Bonded Disc Packs LGD

for customer assembled Bonded Disc Pack Flange Mandrels with large component tolerances for setup to different clamping diameters within a given size

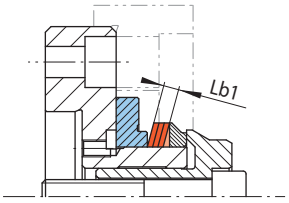


48-1

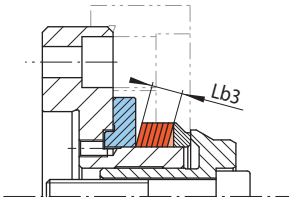
Key

d = Seating diameter
D = Achievable clamping diameter
Δ D = Maximum diameter change of the clamping diameter of the Clamping Element
s = Clamping disc thickness
n = Number of Clamping Discs (max. 12)
Lb_n = s • n
= Bonded disc pack width
M_n = M_1 • n
= Max. transmissible torque
Fm_n = Fm_1 • n
= Required actuating force for component clamping with pull-back action
Fo_n = Fo_1 • n
= Required actuating force for component clamping without pull-back action

Installation situations



Bonded disc pack widths Lb1



Bonded disc pack width Lb3

48-2

Size LGD …			Clamping Discs LGD					Bonded Disc Packs LGD									
								Bonded disc pack width Lb1					Bonded disc pack width Lb3				
d	D*	Δ D	s	M_1	Fm_1	Fo_1	Art.-No.	Lb1	M_n	Fm_n	Fo_n	Art.-No.	Lb3	M_n	Fm_n	Fo_n	Art.-No.
mm	mm	mm	mm	Nm	N	N	1003.	mm	Nm	N	N	3023.	mm	Nm	N	N	3023.
15	32 - 37	0,8	0,9	3,1	1300	1050	015001	5,4	19	7800	6300	015002	10,8	37	15500	12500	015003
20	37 - 42	0,8	0,9	5,9	1850	1500	020001	5,4	33	11100	9000	020001	10,8	70	22000	18000	020002
25	42 - 47	0,8	0,9	9,4	2400	1950	025001	5,4	56	14400	11700	025001	10,8	110	28800	23500	025002
30	47 - 52	0,8	0,9	13	2700	2250	030001	5,4	78	16200	13500	030003	10,8	150	32400	27000	030004
35	52 - 57	0,8	0,9	18	3200	2600	035001	5,4	110	19200	15600	035001	10,8	210	38400	31200	035002
40	57 - 62	0,8	0,9	24	3700	3000	040001	5,4	140	22200	18000	040002	10,8	280	44400	36000	040003
45	62 - 67	0,8	0,9	30	4300	3500	045001	5,4	180	25800	21000	045001	10,8	360	51600	42000	045002
50	67 - 70	0,8	0,9	39	4800	3900	050001	5,4	230	28800	23400	050003	10,8	460	57600	46800	050004
	70 - 75	1,0	1,15	48	6300	5200	050002	6,9	290	37800	31200	050005	13,8	570	75600	62400	050006
	75 - 80	1,0	1,15	49	6100	4900	050003	6,9	290	36600	29400	050007	13,8	580	73200	58800	050008
60	80 - 85	1,0	1,15	72	7700	6300	060001	6,9	430	46200	37800	060001	13,8	860	92400	75600	060002
	85 - 90	1,0	1,15	72	7400	6000	060002	6,9	430	44400	36000	060003	13,8	860	88800	72000	060004
70	90 - 95	1,0	1,15	99	9100	7500	070001	6,9	590	54600	45000	070001	13,8	1180	109200	90000	070002
	95 - 100	1,0	1,15	99	8700	7100	070002	6,9	590	52200	42600	070003	13,8	1180	104400	85200	070004
80	100 - 105	1,0	1,15	130	10500	8600	080001	6,9	780	63000	51600	080001	13,8	1550	126000	103200	080002
	105 - 110	1,0	1,15	130	10000	8200	080002	6,9	780	60000	49200	080003	13,8	1550	120000	98400	080004
90	110 - 115	1,0	1,15	170	11900	9800	090001	6,9	1000	71400	58800	090001	13,8	2040	142800	117600	090002
	115 - 120	1,0	1,15	170	11500	9300	090002	6,9	1000	69000	56000	090003	13,8	2040	138000	111600	090004
100	120 - 125	1,0	1,15	210	13500	11000	100001	6,9	1250	81000	66000	100001	13,8	2520	162000	132000	100002
	125 - 130	1,0	1,15	210	13000	10500	100002	6,9	1250	78000	63000	100003	13,8	2520	156000	126000	100004
	130 - 140	1,3	1,5	250	15500	12500	100003	9	1500	93000	75000	100005	18	3000	186000	150000	100006
115	140 - 150	1,3	1,5	330	19000	15500	115001	9	1980	114000	93000	115001	18	3960	228000	186000	115002
125	150 - 160	1,3	1,5	400	21000	17000	125001	9	2400	126000	102000	125001	18	4800	252000	204000	125002
135	160 - 170	1,3	1,5	470	22500	18500	135001	9	2820	135000	111000	135001	18	5640	270000	222000	135002
145	170 - 180	1,3	1,5	540	24500	20000	145001	9	3240	147000	120000	145001	18	6480	294000	240000	145002
155	180 - 190	1,3	1,5	630	26500	22000	155001	9	3780	159000	132000	155001	18	7560	318000	264000	155002
	190 - 200	1,3	1,5	620	24500	20000	155002	9	3720	147000	120000	155003	18	7440	294000	240000	155004

* Clamping diameter from > up to ≤ adjustable to two places after the decimal point

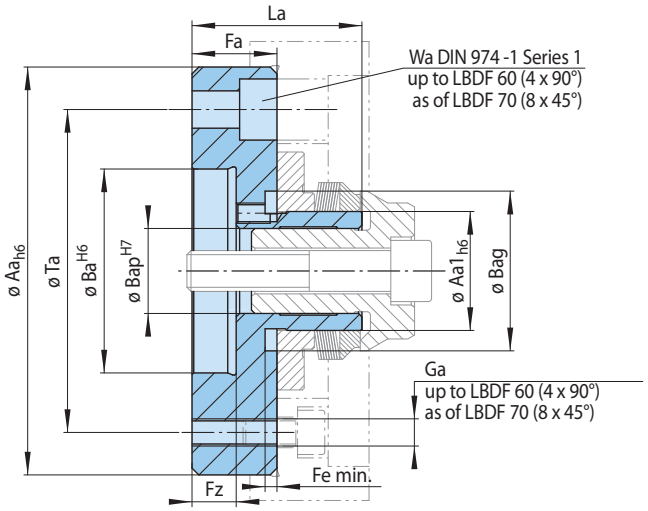
The Bonded Disc Packs LGD have a larger taper angle than the Bonded Disc Packs LBD. This makes it possible to clamp larger component tolerances up to IT14 securely. The achievable true running accuracy is ≤ 0,03 mm. Bonded Disc Packs LGD can also be used in Bonded Disc Pack Flange Mandrels. We request that you contact us.

Example for ordering

Please indicate the size of the Clamping Element, the clamping diameter of your component, including component tolerance, and the desired bonded disc pack width in your order:

Size:	LGD 15	
Clamping diameter:	35,47 mm	
Component tolerance:	H7	
Bonded disc pack width:	5,4 mm	➡ LGD 15-35,47H7-5,4

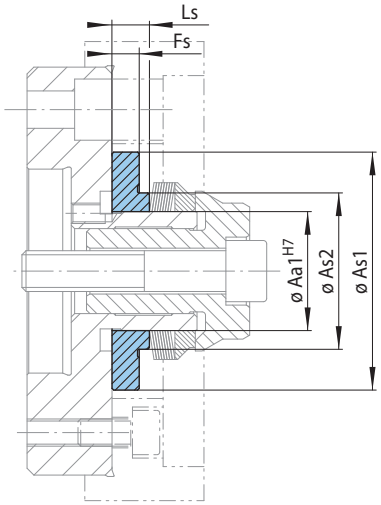
Seating body



49-1

for size	Aa mm	Aa1 mm	Ba mm	Bag mm	Bap mm	Fa mm	Fe min. mm	Fz mm	Ga	La mm	Ta mm	Wa	Art.-No. 2101-
LBDF 11	70	11	37	-	8	20	-	9	M 6	34	50	8	011900
LBDF 15	90	15	50	-	10	20	-	9	M 6	40	70	8	015900
LBDF 20	90	20	50	-	15	20	-	9	M 6	42	70	8	020900
LBDF 25	90	25	50	37	18	25	3,5	11	M 6	50	70	8	025900
LBDF 30	120	30	60	42	20	27	3,5	13	M 8	52	95	10	030900
LBDF 35	120	35	60	47	20	25	3,5	13	M 8	50	95	10	035900
LBDF 40	120	40	60	53	25	30	5,5	13	M 8	60	95	10	040900
LBDF 45	120	45	60	58	30	35	3,5	16	M 8	65	95	10	045900
LBDF 50	140	50	60	63	35	30	5,5	16	M 8	60	115	12	050900
LBDF 60	160	60	90	80	40	35	7,5	16	M 8	72	135	12	060900
LBDF 70	160	70	90	91	45	37	6,5	16	M 8	75	135	12	070900
LBDF 80	185	80	125	101	50	45	6,5	14	M 8	93	160	12	080900
LBDF 90	185	90	125	111	60	45	6,5	14	M 8	93	160	12	090900
LBDF 100	200	100	125	121	60	45	9,5	14	M 8	93	175	12	100900

Shoulder ring



49-2

for size	Aa1 mm	As1[1] mm	As2 mm	Fs mm	Ls mm	Art.-No. 2112-
LBDF 11	11	35	-	-	5	011910
LBDF 15*	15	45	-	-	9,5	015910
	15	45	-	-	7	015911
LBDF 20	20	50	-	-	8	020910
LBDF 25	25	55	36	9	12	025910
LBDF 30	30	60	41	8	11	030910
LBDF 35	35	70	46	8	11	035910
LBDF 40	40	70	51	11	16	040910

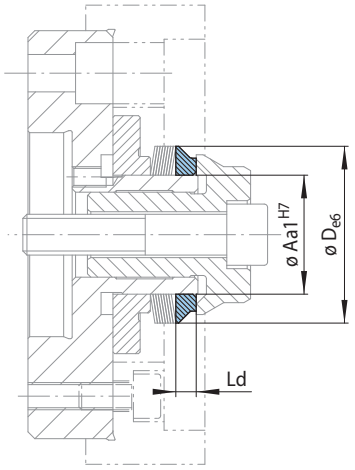
for size	Aa1 mm	As1[1] mm	As2 mm	Fs mm	Ls mm	Art.-No. 2112-
LBDF 45	45	75	56	13,0	16,0	045910
LBDF 50*	50	90	61	10,5	15,5	050910
	50	90	61	8,5	13,5	050911
LBDF 60	60	100	79	14,0	21,0	060910
LBDF 70	70	110	89	15,5	21,5	070910
LBDF 80	80	120	99	24,5	30,5	080910
LBDF 90	90	130	109	25,0	31,0	090910
LBDF 100	100	150	119	21,0	30,0	100910

The rule for Bonded Disc Packs with widths of Lb1 and Lb2 is that the component chamfer length must not exceed Ls - Fs . For disc pack width Lb3, the chamfer length must not exceed Fs.

* Two shoulder rings of different lengths are available for sizes LBDF 15 and LBDF 50. The longer shoulder rings is to be used for bonded disc pack width Lb1, while the shorter shoulder ring is designed for use with bonded disc pack width Lb2 and Lb3.

[1] Largest permissible backstop diameter on the component is As1 - 3 mm

Thrust ring



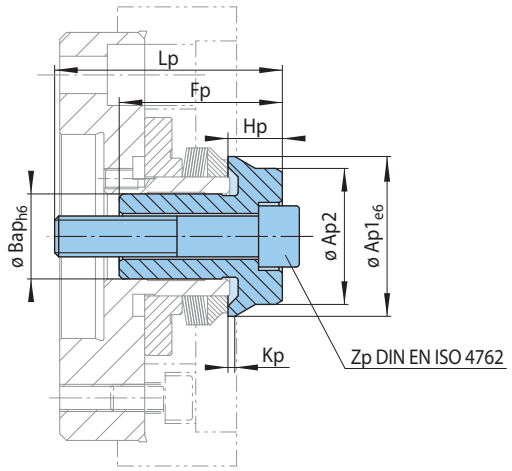
50-1

for size	Aa1 mm	D* mm	Ld mm	Art.-No. 1116-
LBDF 11	11	18 - 22	5	011001
LBDF 15	15	22 - 27	5	015001
	15	27 - 32	5	015002
	15	32 - 37	5	015003
LBDF 20	20	32 - 37	5	020001
	20	37 - 42	5	020002
LBDF 25	25	37 - 42	5	025001
	25	42 - 47	5	025002
LBDF 30	30	42 - 47	6	030001
	30	47 - 52	6	030002
LBDF 35	35	47 - 52	6	035001
	35	52 - 57	6	035002
LBDF 40	40	52 - 57	6	040001
	40	57 - 62	6	040002
LBDF 45	45	57 - 62	6	045001
	45	62 - 67	6	045002

for size	Aa1 mm	D* mm	Ld mm	Art.-No. 1116-
LBDF 50	50	62 - 67	6	050001
	50	67 - 70	6	050002
	50	70 - 75	6	050003
	50	75 - 80	6	050004
LBDF 60	60	80 - 85	6	060001
	60	85 - 90	6	060002
LBDF 70	70	90 - 95	6	070001
	70	95 - 100	6	070002
LBDF 80	80	100 - 105	8	080001
	80	105 - 110	8	080002
LBDF 90	90	110 - 115	8	090001
	90	115 - 120	8	090002
LBDF 100	100	120 - 125	8	100001
	100	125 - 130	8	100002
	100	130 - 140	8	100004

* Clamping diameter from > up to ≤ adjustable to two places after the decimal point

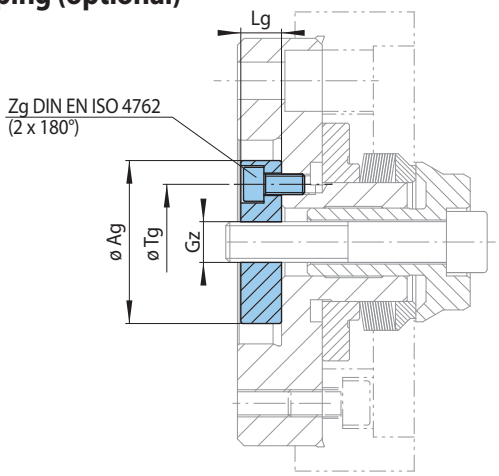
Mushroom bush with cylinder screw



50-2

for size	Ap1 mm	Ap2 mm	Bap mm	Fp mm	Hp mm	Kp mm	Lp mm	Zp	Art.-No. 3143-
LBDF 11	18	15	8	28	10	1	45	M 5x40	011900
LBDF 15	22	18	10	34	12	1	56	M 6x50	015900
LBDF 20	32	26	15	39	13	2	56	M 8x50	020900
LBDF 25	37	30	18	45	14	2	66	M 10x60	025900
LBDF 30	42	35	20	50	14	2	66	M 12x60	030900
LBDF 35	47	40	20	48	16	2	67	M 12x60	035900
LBDF 40	52	45	25	60	16	2	76	M 12x70	040900
LBDF 45	57	50	30	60	16	2	88	M 16x80	045900
LBDF 50	62	55	35	57	17	3	81	M 16x70	050900
LBDF 60	80	70	40	72	22	4	95	M 16x80	060900
LBDF 70	90	80	45	78	24	5	105	M 16x90	070900
LBDF 80	100	90	50	86	25	5	115	M 20x100	080900
LBDF 90	110	100	60	85	24	5	115	M 20x100	090900
LBDF 100	120	110	60	89	29	5	121	M 20x100	100900

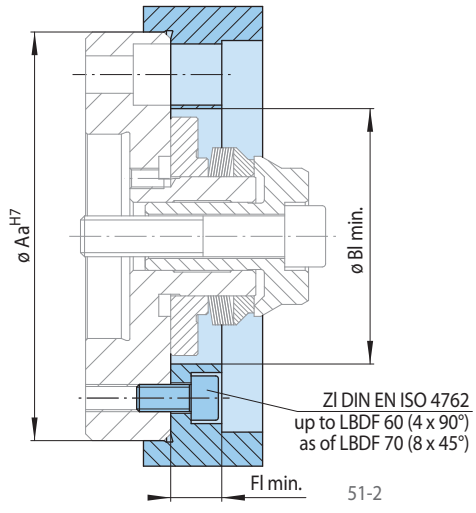
Assembly group for hand clamping (optional)



51-1

for size	Ag mm	Gz	Lg mm	Tg mm	Zg	Art.-No. 3128-
LBDF 11	36	M 5	8	24	M 5	036900
LBDF 15	36	M 6	8	24	M 5	036901
LBDF 20	36	M 8	8	24	M 5	036902
LBDF 25	43	M 10	10	30	M 6	043900
LBDF 30	48	M 12	12	34	M 6	048900
LBDF 35	48	M 12	12	34	M 6	048900
LBDF 40	48	M 12	12	34	M 6	048900
LBDF 45	58	M 16	15	44	M 6	058900
LBDF 50	58	M 16	15	44	M 6	058900
LBDF 60	68	M 16	15	54	M 6	068900
LBDF 70	68	M 16	15	54	M 6	068900
LBDF 80	89,5	M 20	20	72	M 8	089900
LBDF 90	89,5	M 20	20	72	M 8	089900
LBDF 100	89,5	M 20	20	72	M 8	089900

Backstop ring (optional)



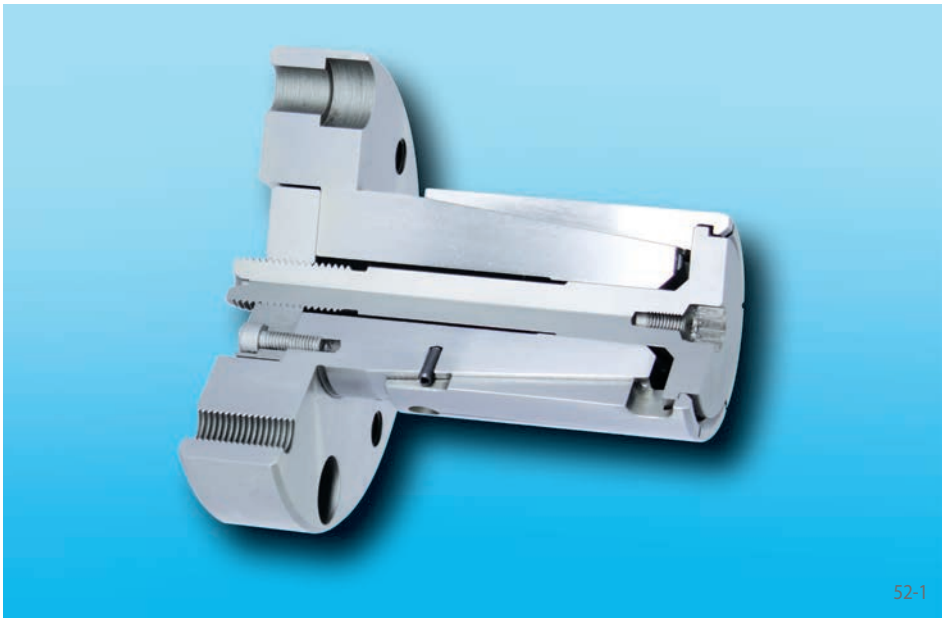
51-2

for size	Aa mm	Bl min. mm	Fl min. mm	Zl
LBDF 11	70	37	10	M 6
LBDF 15	90	47	10	M 6
LBDF 20	90	52	10	M 6
LBDF 25	90	57	10	M 6
LBDF 30	120	62	14	M 8
LBDF 35	120	72	14	M 8
LBDF 40	120	72	14	M 8
LBDF 45	120	77	14	M 8
LBDF 50	140	92	14	M 8
LBDF 60	160	102	14	M 8
LBDF 70	160	112	14	M 8
LBDF 80	185	122	14	M 8
LBDF 90	185	132	14	M 8
LBDF 100	200	152	14	M 8

Missing dimensions reflect component geometry.

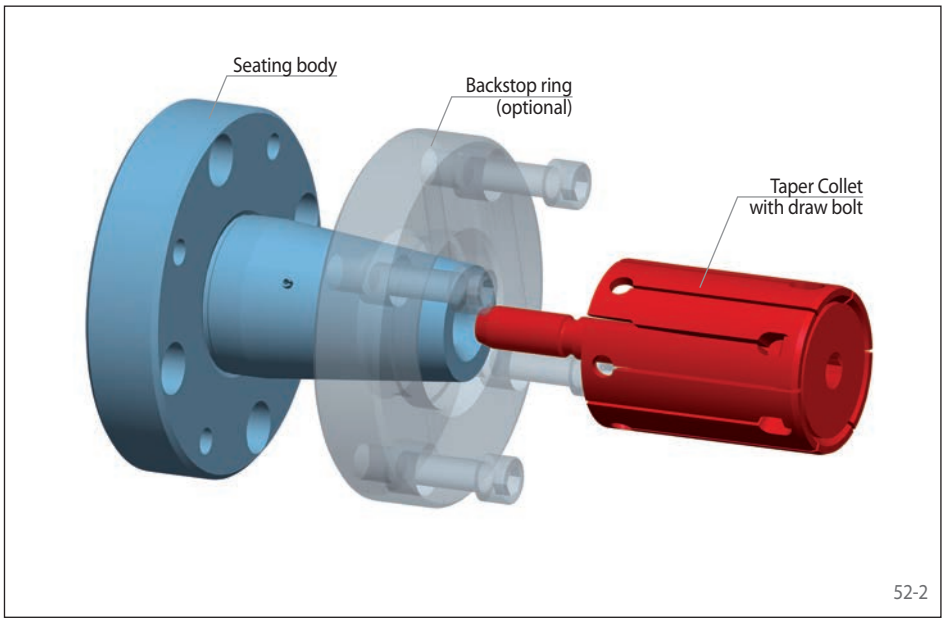
Taper Collet Flange Mandrels BKDF

as Complete Clamping Fixture



Features

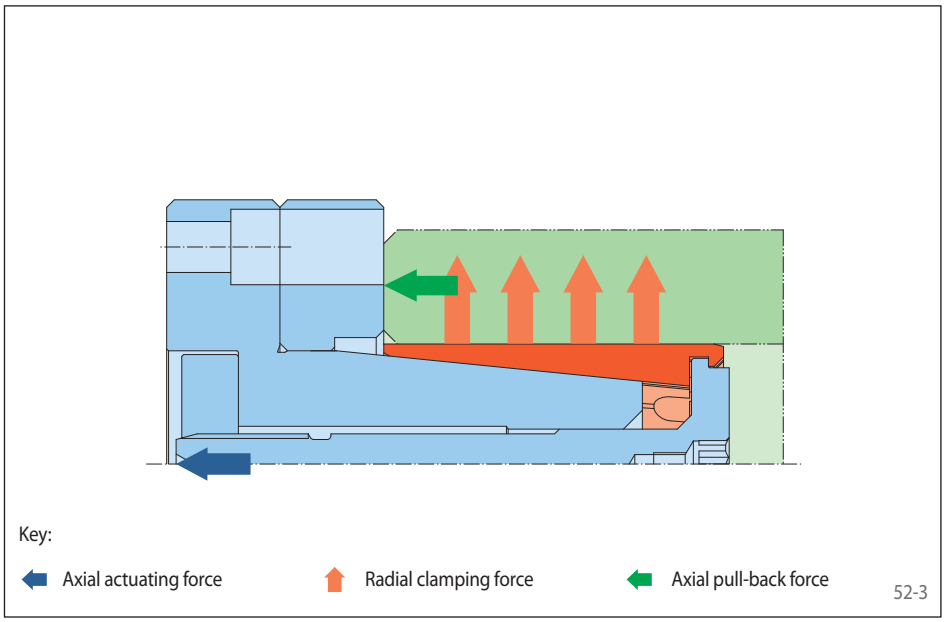
- For clamping diameters from 11,9 mm to 129,6 mm
- High true running accuracy ≤ 0,01 mm
- Permissible component tolerance up to IT15
- Pull-back against external backstop surface or optional, individually designed external backstop ring
- For thin-walled or solid components
- Hand clamping optional possible



Configuration

The Taper Collet Flange Mandrel consists of a seating body and a Taper Collet with draw bolt. Taper Collets with hexagon head or pre-centring, a backstop ring and a plate with threaded bore are optionally available. The Taper Collet Flange Mandrel is attached to the machine with the seating body. The Clamping Fixture is actuated by the draw bolt, which is connected to the machine power actuating unit.

Intermediate Flanges and Spring Force Actuators are shown starting on page 86.



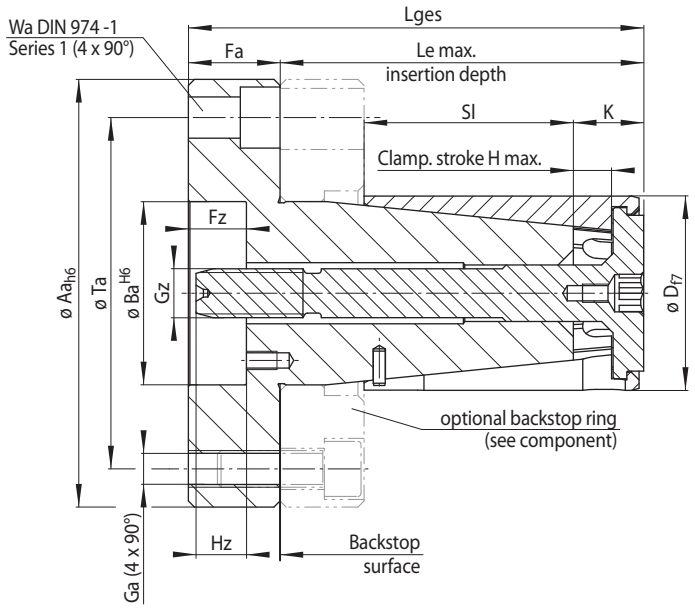
Clamping principle

For clamping, the Taper Collet is pulled against the seating body. The component is centred, pressed against the backstop and aligned flush.

The cylindrical form of the component bore in the clamping area has to be smaller than the tolerance class IT7, independent of the component bore tolerance.

Taper Collet Flange Mandrels BKDF

as Complete Clamping Fixture



53-1

Size	Clamping range D[1)] mm	Maximum diameter change* Δ D mm	Max. transmissible torque** M Nm	Max. Actuating force** F N	Aa mm	Ba mm	Fa mm	Fz mm	Ga	Gz	H max. mm	Hz mm	K mm	Le max. mm	Lges mm	Sl mm	Ta mm	Wa
BKDF 6	11,90 - 15,00	0,6	11	5000	70	37	20	9	M 8	M 5	3	18,4	8	32,6	52,6	15	50	8
BKDF 7	14,70 - 20,90	1,2	13	5000	70	37	20	9	M 8	M 5	6	18,4	11	49,1	69,1	24	50	8
BKDF 12	20,70 - 27,90	1,2	44	12000	70	37	20	9	M 8	M 8	6	16,4	12	64,2	84,2	33	50	8
BKDF 18	27,70 - 32,80	1,2	58	12000	70	37	20	9	M 8	M 8	6	16,4	12	61,5	81,5	33	50	8
BKDF 19	32,60 - 42,80	1,2	114	20000	90	50	30	14	M 8	M 12	6	18,3	13	83,0	113,0	52	70	8
BKDF 27	42,60 - 51,80	1,2	147	20000	90	50	30	14	M 8	M 12	6	18,3	13	83,0	113,0	52	70	8
BKDF 32	51,60 - 64,00	2,4	273	30000	120	60	30	19	M 10	M 16	12	16,5	22	118,5	148,5	68	95	10
BKDF 43	63,60 - 72,00	2,4	333	30000	140	60	30	19	M 12	M 16	12	16,5	22	118,5	148,5	68	115	12
BKDF 44	71,60 - 82,00	2,4	373	30000	140	60	30	19	M 12	M 16	12	16,5	22	148,5	178,5	98	115	12
BKDF 54	81,60 - 132,00	2,4	424	30000	140	60	30	19	M 12	M 16	12	16,5	22	148,5	178,5	98	115	12

[1)] Please note the standard clamping ranges according to the tables on the next pages „Clamping Elements Taper Collets".
* of the clamping diameter of the Clamping Element.
** for clamping with pull-back action.

Example for ordering

Please indicate the size of the Clamping Fixture and the clamping range of the requested Taper Collet, in your order:

Size:	BKDF 27
Clamping range:	46,60 - 47,80 mm

➡ BKDF 27-46,60-47,80

Insertion depth

The minimum insertion depth $Le_{min.}$ is derived according to the following formula from the component chamfer length Lf and dimension K:

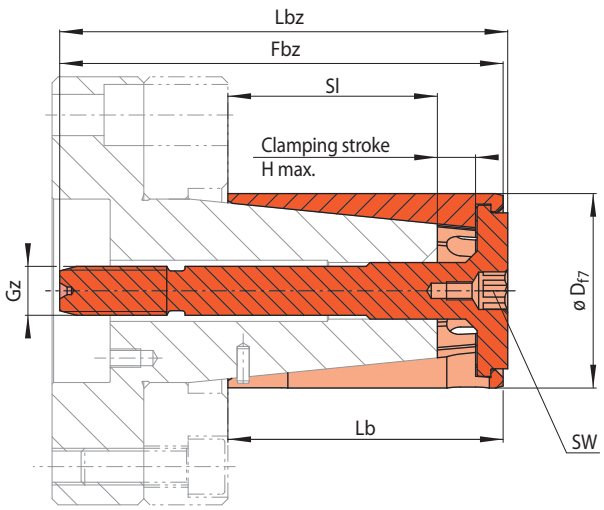
$Le_{min.} = K + Lf$

Customer assembly

The Taper Collets and components shown on pages 54 to 61 are available for customer assembled Taper Collet Flange Mandrels.

Clamping Elements Taper Collets with draw bolt BKD

for customer assembled Taper Collet Flange Mandrels
for setup to different clamping diameters within a given size



54-1

Example for ordering

Please indicate the size of the Clamping Element and the clamping range of the requested Taper Collet, in your order:

Size:	BKD 27
Clamping range:	46,60 - 47,80 mm

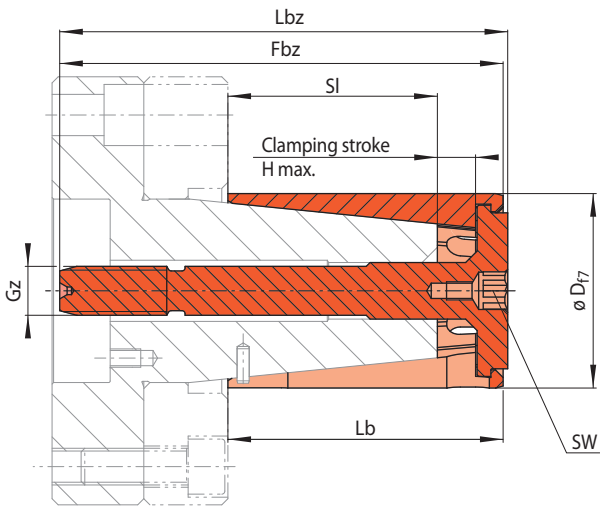
➡ BKD 27-46,60-47,80

Size BKD …	Clamping range[1)] D mm	Max. transmissible torque* M Nm	Max. Actuating force* F N	Tightening torque for hand clamping* M_H Nm	Fbz mm	Gz	H max.** mm	Lb mm	Lbz mm	Sl mm	SW mm	Art.-No. 3198-
6	11,90 - 12,50	11	5000	5	61,8	M 5	3	23	62,5	15	3	006103-011.90
	12,40 - 13,00	11	5000	5	61,8	M 5	3	23	62,5	15	3	006103-012.40
	12,90 - 13,50	11	5000	5	61,8	M 5	3	23	62,5	15	3	006103-012.90
	13,40 - 14,00	11	5000	5	61,8	M 5	3	23	62,5	15	3	006103-013.40
	13,90 - 14,50	11	5000	5	61,8	M 5	3	23	62,5	15	3	006103-013.90
	14,40 - 15,00	11	5000	5	61,8	M 5	3	23	62,5	15	3	006103-014.40
7	14,70 - 15,90	13	5000	5	76,8	M 5	6	35	79,0	24	3	007106-014.70
	15,70 - 16,90	13	5000	5	76,8	M 5	6	35	79,0	24	3	007106-015.70
	16,70 - 17,90	13	5000	5	76,8	M 5	6	35	79,0	24	3	007106-016.70
	17,70 - 18,90	13	5000	5	76,8	M 5	6	35	79,0	24	3	007106-017.70
	18,70 - 19,90	13	5000	5	76,8	M 5	6	35	79,0	24	3	007106-018.70
	19,70 - 20,90	13	5000	5	76,8	M 5	6	35	79,0	24	3	007106-019.70
12	20,70 - 21,90	44	12000	20	89,3	M 8	6	45	92,0	33	5	012165-020.70
	21,70 - 22,90	44	12000	20	89,3	M 8	6	45	92,0	33	5	012165-021.70
	22,70 - 23,90	44	12000	20	89,3	M 8	6	45	92,0	33	5	012165-022.70
	23,70 - 24,90	44	12000	20	89,3	M 8	6	45	92,0	33	5	012165-023.70
	24,70 - 25,90	44	12000	20	89,3	M 8	6	45	92,0	33	5	012165-024.70
	25,70 - 26,90	44	12000	20	89,3	M 8	6	45	92,0	33	5	012165-025.70
	26,70 - 27,90	44	12000	20	89,3	M 8	6	45	92,0	33	5	012165-026.70
18	27,70 - 28,90	58	12000	24	88,4	M 8	6	45	89,4	33	5	018179-027.70
	28,70 - 29,90	58	12000	24	88,4	M 8	6	45	89,4	33	5	018179-028.70
	29,70 - 30,90	58	12000	24	88,4	M 8	6	45	89,4	33	5	018179-029.70
	30,60 - 31,80	58	12000	24	88,4	M 8	6	45	89,4	33	5	018179-030.60
	31,60 - 32,80	58	12000	24	88,4	M 8	6	45	89,4	33	5	018179-031.60
19	32,60 - 33,80	114	20000	51	116,8	M 12	6	65	117,8	52	8	018180-032.60
	33,60 - 34,80	114	20000	51	116,8	M 12	6	65	117,8	52	8	018180-033.60
	34,60 - 35,80	114	20000	51	116,8	M 12	6	65	117,8	52	8	018180-034.60
	35,60 - 36,80	114	20000	51	116,8	M 12	6	65	117,8	52	8	018180-035.60
	36,60 - 37,80	114	20000	51	116,8	M 12	6	65	117,8	52	8	018180-036.60
	37,60 - 38,80	114	20000	51	116,8	M 12	6	65	117,8	52	8	018180-037.60
	38,60 - 39,80	114	20000	51	116,8	M 12	6	65	117,8	52	8	018180-038.60
	39,60 - 40,80	114	20000	51	116,8	M 12	6	65	117,8	52	8	018180-039.60
	40,60 - 41,80	114	20000	51	116,8	M 12	6	65	117,8	52	8	018180-040.60
	41,60 - 42,80	114	20000	51	116,8	M 12	6	65	117,8	52	8	018180-041.60
27	42,60 - 43,80	147	20000	62	116,8	M 12	6	65	117,8	52	8	027108-042.60
	43,60 - 44,80	147	20000	62	116,8	M 12	6	65	117,8	52	8	027108-043.60
	44,60 - 45,80	147	20000	62	116,8	M 12	6	65	117,8	52	8	027108-044.60
	45,60 - 46,80	147	20000	62	116,8	M 12	6	65	117,8	52	8	027108-045.60
	46,60 - 47,80	147	20000	62	116,8	M 12	6	65	117,8	52	8	027108-046.60
	47,60 - 48,80	147	20000	62	116,8	M 12	6	65	117,8	52	8	027108-047.60
	48,60 - 49,80	147	20000	62	116,8	M 12	6	65	117,8	52	8	027108-048.60
	49,60 - 50,80	147	20000	62	116,8	M 12	6	65	117,8	52	8	027108-049.60
	50,60 - 51,80	147	20000	62	116,8	M 12	6	65	117,8	52	8	027108-050.60

* for clamping with pull-back action. • ** Clamping stroke H max. describes the load limit of the clamping element while activation without component. • [1)] Other clamping ranges available on short notice by request

Clamping Elements Taper Collets with draw bolt BKD

for customer assembled Taper Collet Flange Mandrels
for setup to different clamping diameters within a given size



55-1

Example for ordering

Please indicate the size of the Clamping Element and the clamping range of the requested Taper Collet, in your order:

Size:	BKD 32
Clamping range:	55,60 - 58,00 mm

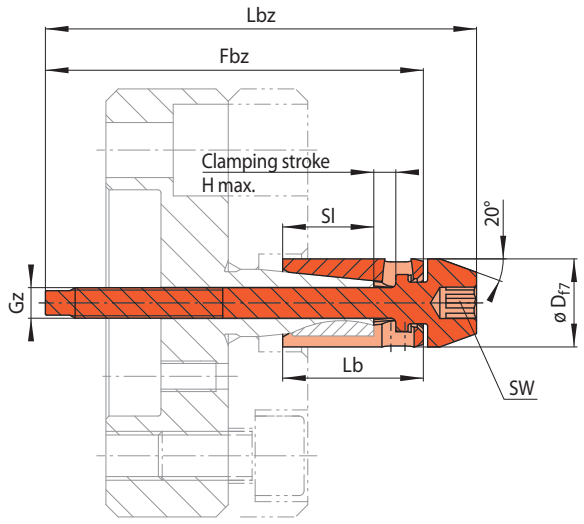
➡ BKD 32-55,60-58,00

Size BKD …	Clamping range[1)] D mm	Max. transmissible torque* M Nm	Max. Actuating force* F N	Tightening torque for hand clamping* M_H Nm	Fbz mm	Gz	H max.** mm	Lb mm	Lbz mm	Sl mm	SW mm	Art.-No. 3198-
32	51,60 - 54,00	273	30000	113	145,5	M 16	12	90	146,5	68	12	032112-051.60
	53,60 - 56,00	273	30000	113	145,5	M 16	12	90	146,5	68	12	032112-053.60
	55,60 - 58,00	273	30000	113	145,5	M 16	12	90	146,5	68	12	032112-055.60
	57,60 - 60,00	273	30000	113	145,5	M 16	12	90	146,5	68	12	032112-057.60
	59,60 - 62,00	273	30000	113	145,5	M 16	12	90	146,5	68	12	032112-059.60
	61,60 - 64,00	273	30000	113	145,5	M 16	12	90	146,5	68	12	032112-061.60
43	63,60 - 66,00	333	30000	134	145,5	M 16	12	90	146,5	68	12	043107-063.60
	65,60 - 68,00	333	30000	134	145,5	M 16	12	90	146,5	68	12	043107-065.60
	67,60 - 70,00	333	30000	134	145,5	M 16	12	90	146,5	68	12	043107-067.60
	69,60 - 72,00	333	30000	134	145,5	M 16	12	90	146,5	68	12	043107-069.60
44	71,60 - 74,00	373	30000	140	175,5	M 16	12	120	176,5	98	12	043108-071.60
	73,60 - 76,00	373	30000	140	175,5	M 16	12	120	176,5	98	12	043108-073.60
	75,60 - 78,00	373	30000	140	175,5	M 16	12	120	176,5	98	12	043108-075.60
	77,60 - 80,00	373	30000	140	175,5	M 16	12	120	176,5	98	12	043108-077.60
	79,60 - 82,00	373	30000	140	175,5	M 16	12	120	176,5	98	12	043108-079.60
54	81,60 - 84,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054110-081.60
	83,60 - 86,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054110-083.60
	85,60 - 88,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054110-085.60
	87,60 - 90,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054110-087.60
	89,60 - 92,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054110-089.60
	91,60 - 94,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054110-091.60
	93,60 - 96,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054110-093.60
	95,60 - 98,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054110-095.60
	97,60 - 100,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054110-097.60
	99,60 - 102,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054110-099.60
	101,60 - 104,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054111-101.60
	103,60 - 106,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054111-103.60
	105,60 - 108,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054111-105.60
	107,60 - 110,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054111-107.60
	109,60 - 112,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054111-109.60
	111,60 - 114,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054112-111.60
	113,60 - 116,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054112-113.60
	115,60 - 118,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054112-115.60
	117,60 - 120,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054112-117.60
	119,60 - 122,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054112-119.60
	121,60 - 124,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054113-121.60
	123,60 - 126,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054113-123.60
	125,60 - 128,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054113-125.60
	127,60 - 130,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054113-127.60
	129,60 - 132,00	424	30000	159	175,5	M 16	12	120	176,5	98	12	054113-129.60

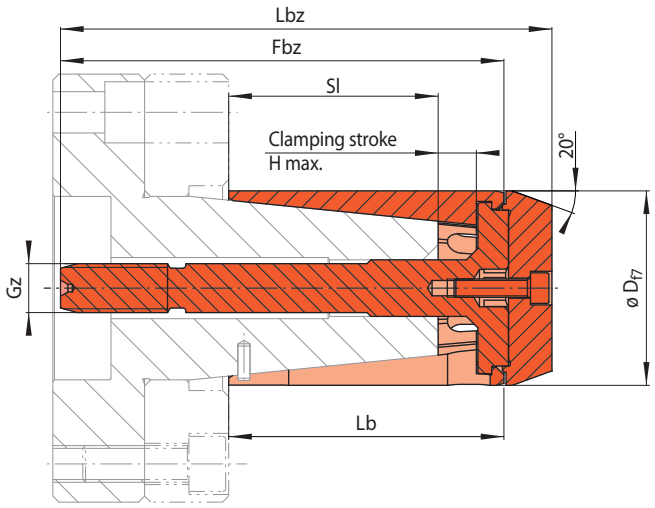
* for clamping with pull-back action. • ** Clamping stroke H max. describes the load limit of the clamping element while activation without component. • [1)] Other clamping ranges available on short notice by request

Clamping Elements Taper Collets with pre-centring BVD

for customer assembled Taper Collet Flange Mandrels
for setup to different clamping diameters within a given size



Sizes BVD 6 and BVD 7 56-1



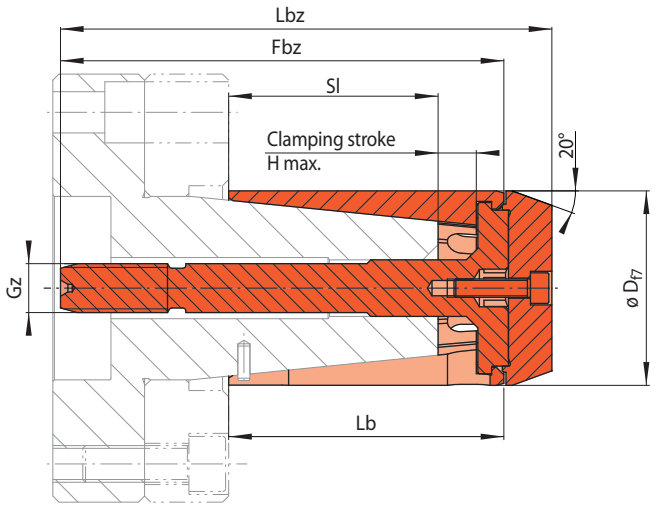
Sizes BVD 12 to BVD 54 56-2

Size BVD …	Clamping range[1)] D mm	Max. transmissible torque* M Nm	Max. Actuating force* F N	Tightening torque for hand clamping* M_H Nm	Fbz mm	Gz	H max.** mm	Lb mm	Lbz mm	Sl mm	SW mm	Art.-No. 3198-
6	11,90 - 12,50	11	5000	5	61,8	M 5	3	23	70,5	15	5	006400-011.90
	12,40 - 13,00	11	5000	5	61,8	M 5	3	23	70,5	15	5	006400-012.40
	12,90 - 13,50	11	5000	5	61,8	M 5	3	23	70,5	15	5	006400-012.90
	13,40 - 14,00	11	5000	5	61,8	M 5	3	23	70,5	15	5	006400-013.40
	13,90 - 14,50	11	5000	5	61,8	M 5	3	23	70,5	15	5	006400-013.90
	14,40 - 15,00	11	5000	5	61,8	M 5	3	23	70,5	15	5	006400-014.40
7	14,70 - 15,90	13	5000	5	76,8	M 5	6	35	88,0	24	5	007400-014.70
	15,70 - 16,90	13	5000	5	76,8	M 5	6	35	88,0	24	5	007400-015.70
	16,70 - 17,90	13	5000	5	76,8	M 5	6	35	88,0	24	5	007400-016.70
	17,70 - 18,90	13	5000	5	76,8	M 5	6	35	88,0	24	5	007400-017.70
	18,70 - 19,90	13	5000	5	76,8	M 5	6	35	88,0	24	5	007400-018.70
	19,70 - 20,90	13	5000	5	76,8	M 5	6	35	88,0	24	5	007400-019.70
12	20,70 - 21,90	44	12000	Power actuating only	89,3	M 8	6	45	99,5	33	-	012400-020.70
	21,70 - 22,90	44	12000		89,3	M 8	6	45	99,5	33	-	012400-021.70
	22,70 - 23,90	44	12000		89,3	M 8	6	45	99,5	33	-	012400-022.70
	23,70 - 24,90	44	12000		89,3	M 8	6	45	99,5	33	-	012400-023.70
	24,70 - 25,90	44	12000		89,3	M 8	6	45	99,5	33	-	012400-024.70
	25,70 - 26,90	44	12000		89,3	M 8	6	45	99,5	33	-	012400-025.70
	26,70 - 27,90	44	12000		89,3	M 8	6	45	99,5	33	-	012400-026.70
18	27,70 - 28,90	58	12000		88,4	M 8	6	45	98,6	33	-	018400-027.70
	28,70 - 29,90	58	12000		88,4	M 8	6	45	98,6	33	-	018400-028.70
	29,70 - 30,90	58	12000		88,4	M 8	6	45	98,6	33	-	018400-029.70
	30,60 - 31,80	58	12000		88,4	M 8	6	45	98,6	33	-	018400-030.60
	31,60 - 32,80	58	12000		88,4	M 8	6	45	98,6	33	-	018400-031.60
19	32,60 - 33,80	114	20000		116,8	M 12	6	65	127	52	-	019400-032.60
	33,60 - 34,80	114	20000		116,8	M 12	6	65	127	52	-	019400-033.60
	34,60 - 35,80	114	20000		116,8	M 12	6	65	127	52	-	019400-034.60
	35,60 - 36,80	114	20000		116,8	M 12	6	65	127	52	-	019400-035.60
	36,60 - 37,80	114	20000		116,8	M 12	6	65	127	52	-	019400-036.60
	37,60 - 38,80	114	20000		116,8	M 12	6	65	127	52	-	019400-037.60
	38,60 - 39,80	114	20000		116,8	M 12	6	65	127	52	-	019400-038.60
	39,60 - 40,80	114	20000		116,8	M 12	6	65	127	52	-	019400-039.60
	40,60 - 41,80	114	20000		116,8	M 12	6	65	127	52	-	019400-040.60
	41,60 - 42,80	114	20000		116,8	M 12	6	65	127	52	-	019400-041.60
27	42,60 - 43,80	147	20000		116,8	M 12	6	65	132	52	-	027400-042.60
	43,60 - 44,80	147	20000		116,8	M 12	6	65	132	52	-	027400-043.60
	44,60 - 45,80	147	20000		116,8	M 12	6	65	132	52	-	027400-044.60
	45,60 - 46,80	147	20000		116,8	M 12	6	65	132	52	-	027400-045.60
	46,60 - 47,80	147	20000		116,8	M 12	6	65	132	52	-	027400-046.60
	47,60 - 48,80	147	20000		116,8	M 12	6	65	132	52	-	027400-047.60
	48,60 - 49,80	147	20000		116,8	M 12	6	65	132	52	-	027400-048.60
	49,60 - 50,80	147	20000		116,8	M 12	6	65	132	52	-	027400-049.60
	50,60 - 51,80	147	20000		116,8	M 12	6	65	132	52	-	027400-050.60

* for clamping with pull-back action. • ** Clamping stroke H max. describes the load limit of the clamping element while activation without component. • [1)] Other clamping ranges available on short notice by request

Clamping Elements Taper Collets with pre-centring BVD

for customer assembled Taper Collet Flange Mandrels
for setup to different clamping diameters within a given size



Sizes BVD 12 to BVD 54 57-1

Example for ordering

Please indicate the size of the Clamping Element and the clamping range of the requested Taper Collet, in your order:

Size:	BVD 32
Clamping range:	55,60 - 58,00 mm

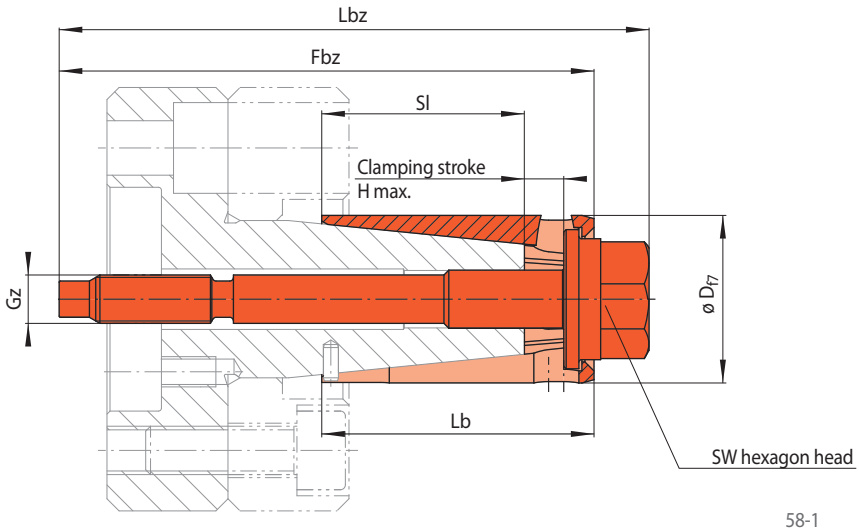
➡ BVD 32-55,60-58,00

Size BVD …	Clamping range[1)] D mm	Max. transmissible torque* M Nm	Max. Actuating force* F N	Fbz mm	Gz	H max.** mm	Lb mm	Lbz mm	Sl mm	Art.-No. 3198-
32	51,60 – 54,00	273	30000	145,5	M 16	12	90	160,7	68	032400-051.60
	53,60 – 56,00	273	30000	145,5	M 16	12	90	160,7	68	032400-053.60
	55,60 – 58,00	273	30000	145,5	M 16	12	90	160,7	68	032400-055.60
	57,60 – 60,00	273	30000	145,5	M 16	12	90	160,7	68	032400-057.60
	59,60 – 62,00	273	30000	145,5	M 16	12	90	160,7	68	032400-059.60
	61,60 – 64,00	273	30000	145,5	M 16	12	90	160,7	68	032400-061.60
43	63,60 – 66,00	333	30000	145,5	M 16	12	120	160,7	68	043400-063.60
	65,60 – 68,00	333	30000	145,5	M 16	12	120	160,7	68	043400-065.60
	67,60 – 70,00	333	30000	145,5	M 16	12	120	160,7	68	043400-067.60
	69,60 – 72,00	333	30000	145,5	M 16	12	120	160,7	68	043400-069.60
44	71,60 – 74,00	373	30000	175,5	M 16	12	120	190,7	98	044400-071.60
	73,60 – 76,00	373	30000	175,5	M 16	12	120	190,7	98	044400-073.60
	75,60 – 78,00	373	30000	175,5	M 16	12	120	190,7	98	044400-075.60
	77,60 – 80,00	373	30000	175,5	M 16	12	120	190,7	98	044400-077.60
	79,60 – 82,00	373	30000	175,5	M 16	12	120	190,7	98	044400-079.60
54	81,60 – 84,00	424	30000	175,5	M 16	12	120	195,6	98	054400-081.60
	83,60 – 86,00	424	30000	175,5	M 16	12	120	195,6	98	054400-083.60
	85,60 – 88,00	424	30000	175,5	M 16	12	120	195,6	98	054400-085.60
	87,60 – 90,00	424	30000	175,5	M 16	12	120	195,6	98	054400-087.60
	89,60 – 92,00	424	30000	175,5	M 16	12	120	195,6	98	054400-089.60
	91,60 – 94,00	424	30000	175,5	M 16	12	120	195,6	98	054400-091.60
	93,60 – 96,00	424	30000	175,5	M 16	12	120	195,6	98	054400-093.60
	95,60 – 98,00	424	30000	175,5	M 16	12	120	195,6	98	054400-095.60
	97,60 – 100,00	424	30000	175,5	M 16	12	120	195,6	98	054400-097.60
	99,60 – 102,00	424	30000	175,5	M 16	12	120	195,6	98	054400-099.60
	101,60 – 104,00	424	30000	175,5	M 16	12	120	195,6	98	054401-101.60
	103,60 – 106,00	424	30000	175,5	M 16	12	120	195,6	98	054401-103.60
	105,60 – 108,00	424	30000	175,5	M 16	12	120	195,6	98	054401-105.60
	107,60 – 110,00	424	30000	175,5	M 16	12	120	195,6	98	054401-107.60
	109,60 – 112,00	424	30000	175,5	M 16	12	120	195,6	98	054401-109.60
	111,60 – 114,00	424	30000	175,5	M 16	12	120	195,6	98	054402-111.60
	113,60 – 116,00	424	30000	175,5	M 16	12	120	195,6	98	054402-113.60
	115,60 – 118,00	424	30000	175,5	M 16	12	120	195,6	98	054402-115.60
	117,60 – 120,00	424	30000	175,5	M 16	12	120	195,6	98	054402-117.60
	119,60 – 122,00	424	30000	175,5	M 16	12	120	195,6	98	054402-119.60
	121,60 – 124,00	424	30000	175,5	M 16	12	120	195,6	98	054403-121.60
	123,60 – 126,00	424	30000	175,5	M 16	12	120	195,6	98	054403-123.60
	125,60 – 128,00	424	30000	175,5	M 16	12	120	195,6	98	054403-125.60
	127,60 – 130,00	424	30000	175,5	M 16	12	120	195,6	98	054403-127.60
	129,60 – 132,00	424	30000	175,5	M 16	12	120	195,6	98	054403-129.60

* for clamping with pull-back action. • ** Clamping stroke H max. describes the load limit of the clamping element while activation without component. • [1)] Other clamping ranges available on short notice by request
Power actuating only

Clamping Elements Taper Collets with hexagon head BAD

for customer assembled Taper Collet Flange Mandrels
for setup to different clamping diameters within a given size



58-1

Example for ordering

Please indicate the size of the Clamping Element and the clamping range of the requested Taper Collet, in your order:

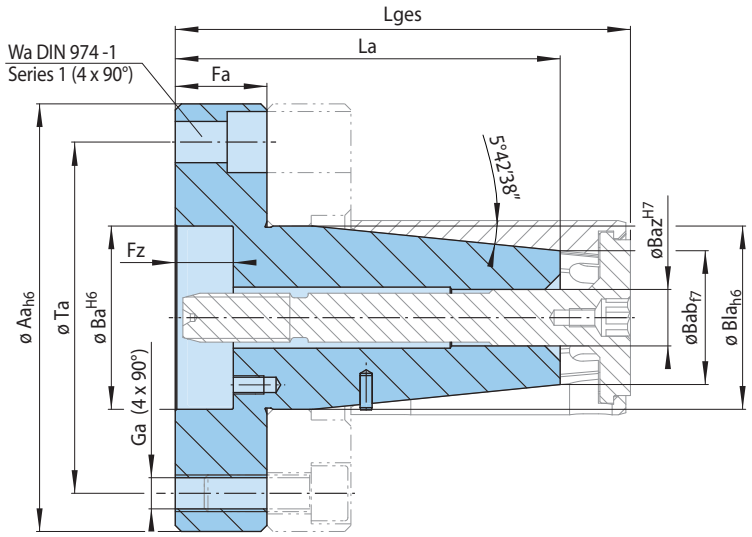
Size:	BAD 18
Clamping range:	29,70 - 30,90 mm

➡ BAD 27-29,70-30,90

Size BAD …	Clamping range[1)] D mm	Max. transmissible torque* M Nm	Tightening torque for hand clamping* M_H Nm	Fbz mm	Gz	H max.** mm	Lb mm	Lbz mm	Sl mm	SW mm	Art.-No. 3198-
6	11,90 - 12,50	11	5	61,8	M 5	3	23	66,5	15	6	006500-011.90
	12,40 - 13,00	11	5	61,8	M 5	3	23	66,5	15	6	006500-012.40
	12,90 - 13,50	11	5	61,8	M 5	3	23	66,5	15	6	006500-012.90
	13,40 - 14,00	11	5	61,8	M 5	3	23	66,5	15	6	006500-013.40
	13,90 - 14,50	11	5	61,8	M 5	3	23	66,5	15	6	006500-013.90
	14,40 - 15,00	11	5	61,8	M 5	3	23	66,5	15	6	006500-014.40
7	14,70 - 15,90	13	5	76,8	M 5	6	35	84,0	24	8	007500-014.70
	15,70 - 16,90	13	5	76,8	M 5	6	35	84,0	24	8	007500-015.70
	16,70 - 17,90	13	5	76,8	M 5	6	35	84,0	24	8	007500-016.70
	17,70 - 18,90	13	5	76,8	M 5	6	35	84,0	24	8	007500-017.70
	18,70 - 19,90	13	5	76,8	M 5	6	35	84,0	24	8	007500-018.70
	19,70 - 20,90	13	5	76,8	M 5	6	35	84,0	24	8	007500-019.70
12	20,70 - 21,90	44	20	89,3	M 8	6	45	98,0	33	12	012500-020.70
	21,70 - 22,90	44	20	89,3	M 8	6	45	98,0	33	12	012500-021.70
	22,70 - 23,90	44	20	89,3	M 8	6	45	98,0	33	12	012500-022.70
	23,70 - 24,90	44	20	89,3	M 8	6	45	98,0	33	12	012500-023.70
	24,70 - 25,90	44	20	89,3	M 8	6	45	98,0	33	12	012500-024.70
	25,70 - 26,90	44	20	89,3	M 8	6	45	98,0	33	12	012500-025.70
	26,70 - 27,90	44	20	89,3	M 8	6	45	98,0	33	12	012500-026.70
18	27,70 - 28,90	58	24	88,4	M 8	6	45	97,5	33	17	018500-027.70
	28,70 - 29,90	58	24	88,4	M 8	6	45	97,5	33	17	018500-028.70
	29,70 - 30,90	58	24	88,4	M 8	6	45	97,5	33	17	018500-029.70
	30,60 - 31,80	58	24	88,4	M 8	6	45	97,5	33	17	018500-030.60
	31,60 - 32,80	58	24	88,4	M 8	6	45	97,5	33	17	018500-031.60
19	32,60 - 33,80	114	51	116,8	M 12	6	65	127,8	52	21	019500-032.60
	33,60 - 34,80	114	51	116,8	M 12	6	65	127,8	52	21	019500-033.60
	34,60 - 35,80	114	51	116,8	M 12	6	65	127,8	52	21	019500-034.60
	35,60 - 36,80	114	51	116,8	M 12	6	65	127,8	52	21	019500-035.60
	36,60 - 37,80	114	51	116,8	M 12	6	65	127,8	52	21	019500-036.60
	37,60 - 38,80	114	51	116,8	M 12	6	65	127,8	52	21	019500-037.60
	38,60 - 39,80	114	51	116,8	M 12	6	65	127,8	52	21	019500-038.60
	39,60 - 40,80	114	51	116,8	M 12	6	65	127,8	52	21	019500-039.60
	40,60 - 41,80	114	51	116,8	M 12	6	65	127,8	52	21	019500-040.60
	41,60 - 42,80	114	51	116,8	M 12	6	65	127,8	52	21	019500-041.60
27	42,60 - 43,80	147	62	116,8	M 12	6	65	130,8	52	27	027500-042.60
	43,60 - 44,80	147	62	116,8	M 12	6	65	130,8	52	27	027500-043.60
	44,60 - 45,80	147	62	116,8	M 12	6	65	130,8	52	27	027500-044.60
	45,60 - 46,80	147	62	116,8	M 12	6	65	130,8	52	27	027500-045.60
	46,60 - 47,80	147	62	116,8	M 12	6	65	130,8	52	27	027500-046.60
	47,60 - 48,80	147	62	116,8	M 12	6	65	130,8	52	27	027500-047.60
	48,60 - 49,80	147	62	116,8	M 12	6	65	130,8	52	27	027500-048.60
	49,60 - 50,80	147	62	116,8	M 12	6	65	130,8	52	27	027500-049.60
	50,60 - 51,80	147	62	116,8	M 12	6	65	130,8	52	27	027500-050.60

* for clamping with pull-back action. • ** Clamping stroke H max. describes the load limit of the clamping element while activation without component. • [1)] Other clamping ranges available on short notice by request

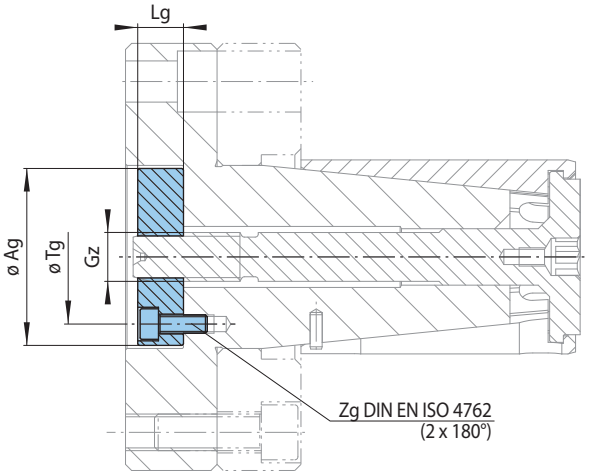
Seating body with anti-rotation protection



59-1

for size	Aa mm	Ba mm	Bab mm	Baz mm	Bla mm	Fa mm	Fz mm	Ga	La mm	Lges mm	Ta mm	Wa	Art.-No. 3169-
BKDF 6	70	37	7,24	5,2	11	20	9	M 8	43,8	52,6	50	8	007009
BKDF 7	70	37	7,8	5,8	14	20	9	M 8	56	69,1	50	8	007010
BKDF 12	70	37	12,0	9,5	20	20	9	M 8	70	84,2	50	8	012009
BKDF 18	70	37	18,2	9,5	26	20	9	M 8	69	81,5	50	8	018015
BKDF 19	90	50	18,2	14,5	30	30	14	M 8	99	113,0	70	8	018016
BKDF 27	90	50	27,2	14,5	39	30	14	M 8	99	113,0	70	8	027008
BKDF 32	120	60	32,8	18,5	49	30	19	M 10	126	148,5	95	10	032013
BKDF 43	140	60	43,8	18,5	60	30	19	M 12	126	148,5	115	12	043015
BKDF 44	140	60	43,8	18,5	66	30	19	M 12	156	178,5	115	12	043016
BKDF 54	140	60	54,8	18,5	77	30	19	M 12	156	178,5	115	12	054011

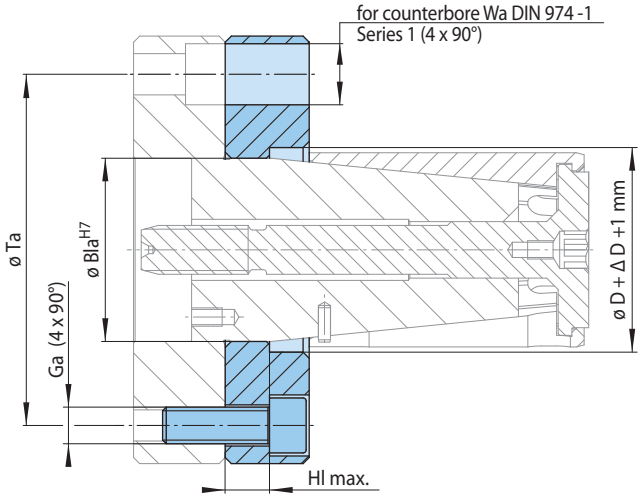
Assembly group for hand clamping (optional)



59-2

for size	Ag mm	Gz	Lg mm	Tg mm	Zg	Art.-No. 3128-
BKDF 6	36	M 5	8	24	M 5	036900
BKDF 7	36	M 5	8	24	M 5	036900
BKDF 12	36	M 8	8	24	M 5	036902
BKDF 18	36	M 8	8	24	M 5	036902
BKDF 19	48	M 12	12	34	M 6	048900
BKDF 27	48	M 12	12	34	M 6	048900
BKDF 32	58	M 16	15	44	M 6	058900
BKDF 43	58	M 16	15	44	M 6	058900
BKDF 44	58	M 16	15	44	M 6	058900
BKDF 54	58	M 16	15	44	M 6	058900

Backstop ring with cylinder screws (optional)



ø D = Clamping diameter
Δ D = Maximum diameter change of the clamping diameter of the Clamping Element

60-1

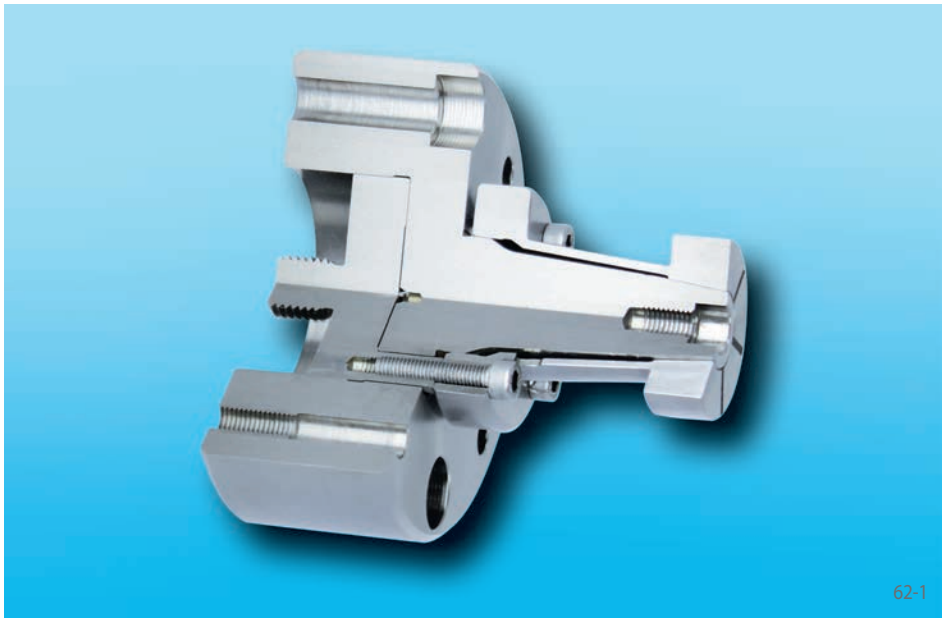
for size	Bla mm	D mm	Δ D mm	Ga	Hl max. mm	Ta mm	Wa
BKDF 6	11	11,90 - 15,00	0,6	M 8	4,0	50	8
BKDF 7	14	14,70 - 20,90	1,2	M 8	4,0	50	8
BKDF 12	20	20,70 - 27,90	1,2	M 8	8,5	50	8
BKDF 18	26	27,70 - 32,80	1,2	M 8	7,5	50	8
BKDF 19	30	32,60 - 42,80	1,2	M 8	9,0	70	8
BKDF 27	39	42,60 - 51,80	1,2	M 8	9,0	70	8
BKDF 32	49	51,60 - 64,00	2,4	M 10	13,5	95	10
BKDF 43	60	63,60 - 72,00	2,4	M 12	13,5	115	12
BKDF 44	66	71,60 - 82,00	2,4	M 12	13,5	115	12
BKDF 54	77	81,60 - 132,00	2,4	M 12	13,5	115	12

Missing dimensions reflect component geometry.

Notes / sketches

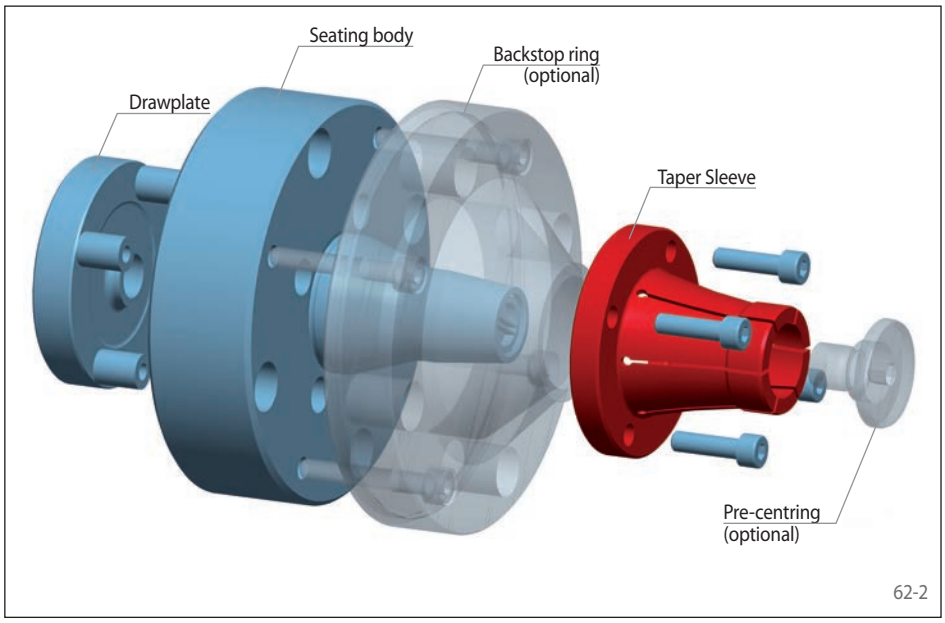
Taper Sleeve Flange Mandrels HKDF

as Complete Clamping Fixture



Features

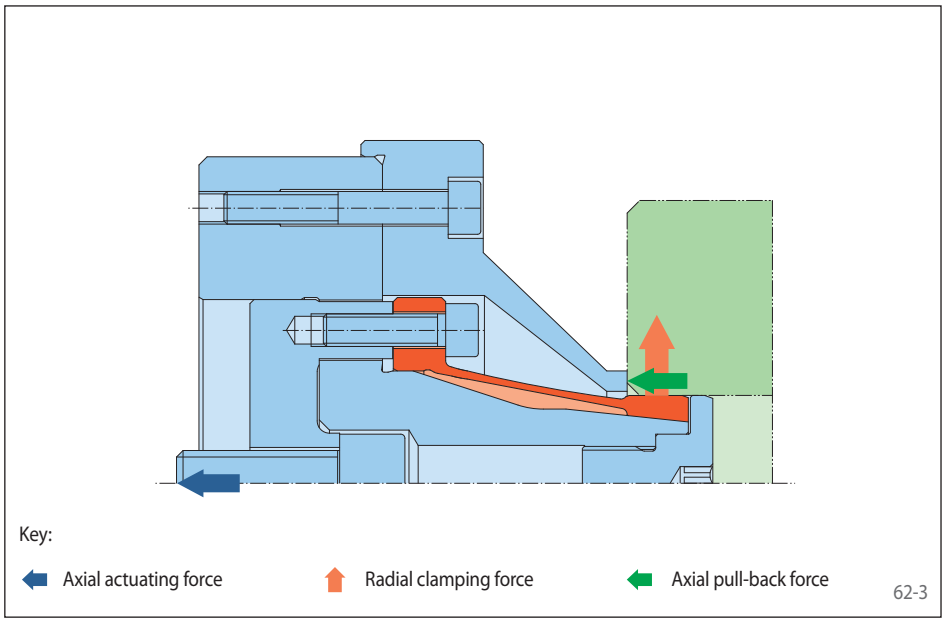
- For clamping diameters from 9 mm to 175 mm
- High true running accuracy ≤ 0,01 mm
- Permissible component tolerance up to IT13
- Pull-back against external backstop surface or optional, individually designed external backstop ring
- Impervious to ingress of foreign objects due to the rubberized slots in the Taper Sleeve



Configuration

The Taper Sleeve Flange Mandrel consists of a draw plate, a seating body and a Taper Sleeve. A backstop ring and a pre-centring are optionally available. The Taper Sleeve Flange Mandrel is attached to the machine with the seating body. The Clamping Fixture is actuated by the draw plate, which is connected to the machine power actuating unit.

Intermediate Flanges and Spring Force Actuators are shown starting on page 86.

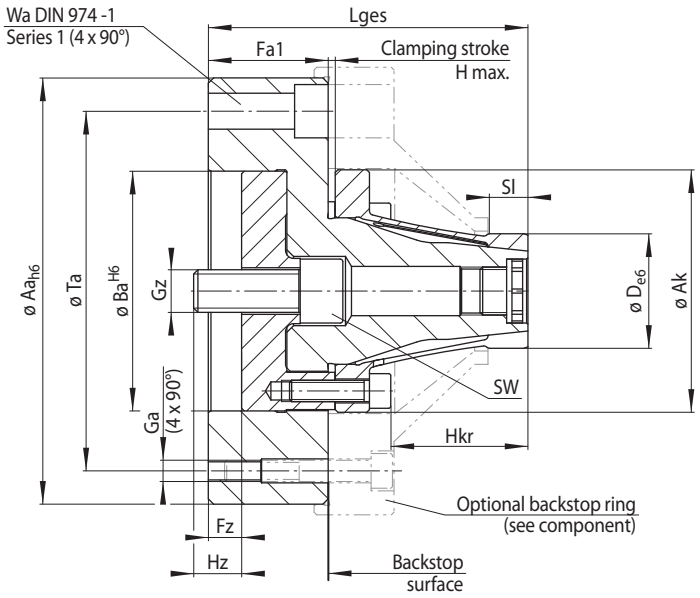


Clamping principle

For clamping, the Taper Sleeve is pulled against the seating body. The component is centred, pressed against the backstop and aligned flush.

Taper Sleeve Flange Mandrels HKDF

as Complete Clamping Fixture



63-1

Size	Achievable clamping diameter D* mm	Maximum diameter change** Δ D mm	Max. transmissible torque*** M Nm	Max. Actuating force*** F N	Aa mm	Ak mm	Ba mm	Fa1 mm	Fz mm	Ga	Gz	H max. mm	Hkr mm	Hz mm	Lges mm	Sl mm	SW mm	Ta mm	Wa
HKDF 4	9 - 16	0,5	6,5	8000	90	51	50	36	14	M 6	M 12	2,7	36,5	14	92	6,5	-	70	8
HKDF 6	15 - 20	0,5	10	9000	90	51	50	36	14	M 6	M 12	2,7	36,5	14	92	8,5	-	70	8
HKDF 7	19 - 26	0,5	12	9000	90	51	50	36	14	M 6	M 12	2,7	36,5	14	92	9,5	-	70	8
HKDF 12	25 - 32	0,5	22	10000	90	51	50	36	14	M 6	M 12	2,7	38,5	14	95	9,5	-	70	8
HKDF 19	31 - 44	0,5	55	16000	120	61	60	49	19	M 8	M 16	2,7	47,5	18	118	14,5	-	95	10
HKDF 30	43 - 55	0,5	158	30000	160	91	90	45	12,5	M 8	M 16	2,8	51,5	18	120	14,5	14	135	12
HKDF 40	54 - 76	0,5	278	40000	160	91	90	45	12,5	M 8	M 16	2,8	61,5	18	130	14,5	14	135	12
HKDF 60	75 - 100	0,5	613	60000	185	126	125	57	12,5	M 8	M 20	2,9	58,5	20	143	14,5	17	160	12
HKDF 80	100 - 125	0,8	1050	80000	250	170	175	68	15	M 8	M 20	4,5	68	22	172,5	19,5	17	225	12
HKDF 100	125 - 150	0,8	1300	80000	250	170	175	68	15	M 8	M 20	4,5	68	22	172,5	19,5	17	225	12
HKDF 125	150 - 175	1,0	2050	100000	275	200	200	73	15,5	M 8	M 20	5,0	75	27	188	24,5	17	250	12

* Clamping diameter adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element. • *** for clamping with pull-back action.

Example for ordering

Please indicate the size of the Clamping Fixture and the clamping diameter of your component, including component tolerance, in your order:

Size:	HKDF 30
Clamping diameter:	50,47 mm
Component tolerance:	H7

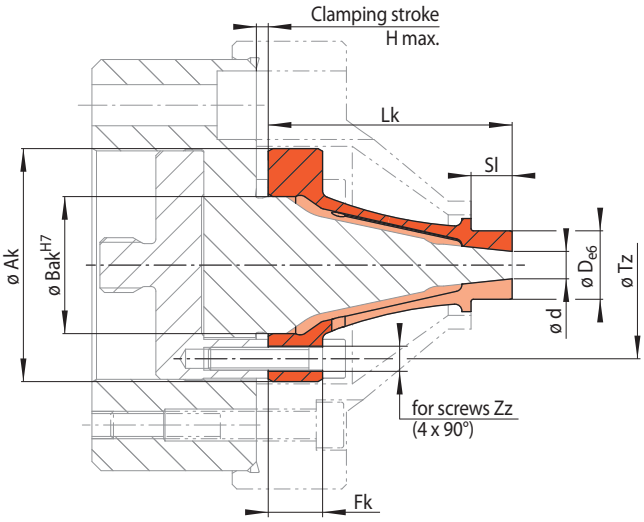
➡ HKDF 30-50,47H7

Customer assembly

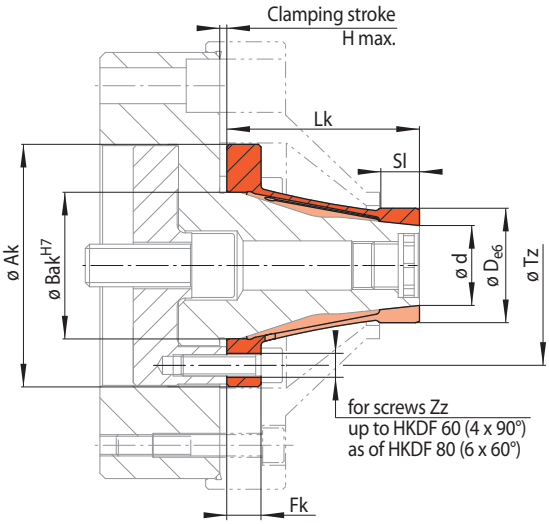
The Taper Sleeves and components shown on pages 64 to 67 are available for customer assembled Taper Sleeve Flange Mandrel.

Clamping Elements Taper Sleeves HKD

for customer assembled Taper Sleeve Flange Mandrels for setup to different clamping diameters within a given size



Sizes HKD 4 to HKD 7 64-1



Sizes HKD 12 to HKD 125 64-2

Size HKD ... d mm	Achievable clamping diameter D* mm	Maximum diameter change** Δ D mm	Max. transmissible torque*** M Nm	Max. Actuating force*** F N	Ak mm	Bak mm	Bk mm	Fk mm	H max. **** mm	Lk mm	Sl mm	Tz mm	Zz	Art.-No. 2198-
4	9 - 16	0,5	6,5	8000	51	30	5,5	12	2,7	53,3	6,5	41	M 5	004501
6	15 - 20	0,5	10	9000	51	30	5,5	12	2,7	53,3	8,5	41	M 5	006501
7	19 - 26	0,5	12	9000	51	30	5,5	12	2,7	53,3	9,5	41	M 5	007501
12	25 - 32	0,5	22	10000	51	31	5,5	13	2,7	56,3	9,5	41	M 5	012501
19	31 - 44	0,5	55	16000	61	34	6,6	13	2,7	66,3	14,5	49	M 6	019501
30	43 - 55	0,5	158	30000	91	55	9,0	12,7	2,8	72,2	14,5	75	M 8	030501
40	54 - 76	0,5	278	40000	91	55	9,0	12,7	2,8	82,2	14,5	75	M 8	040501
60	75 - 100	0,5	613	60000	126	81	11,0	14,6	2,9	83,1	14,5	107	M 10	060501
80	100 - 125	0,8	1050	80000	170	110	13,5	20	4,5	100	19,5	145	M 12	080501
100	125 - 150	0,8	1300	80000	170	110	13,5	20	4,5	100	19,5	145	M 12	100501
125	150 - 175	1,0	2050	100000	200	135	13,5	23	5,0	100	24,5	170	M 12	125501

* Clamping diameter adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element. • *** for clamping with pull-back action.
**** Clamping stroke H max. describes the load limit of the Clamping Element while activation without component.

Example for ordering

Please indicate the size of the Clamping Element and the clamping diameter of your component, including component tolerance, in your order:

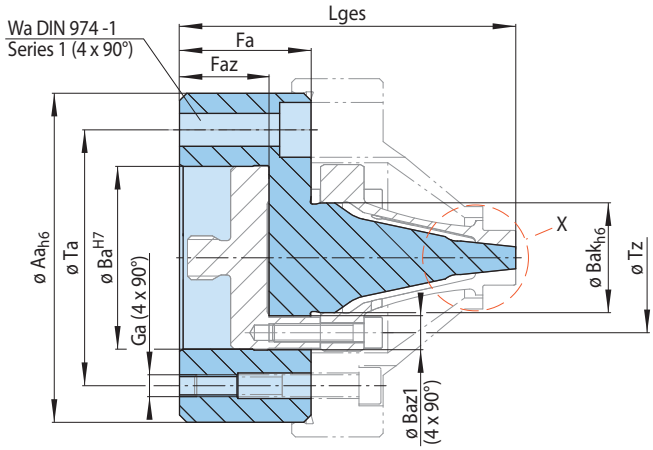
Size:	HKD 30
Clamping diameter:	50,47 mm
Component tolerance:	H7

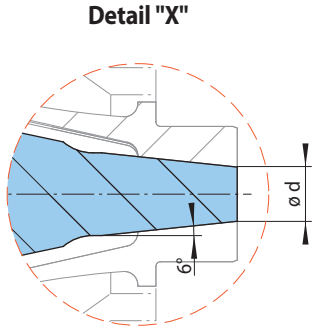
➡ HKD 30-50,47H7

Components

for customer assembled Taper Sleeve Flange Mandrels

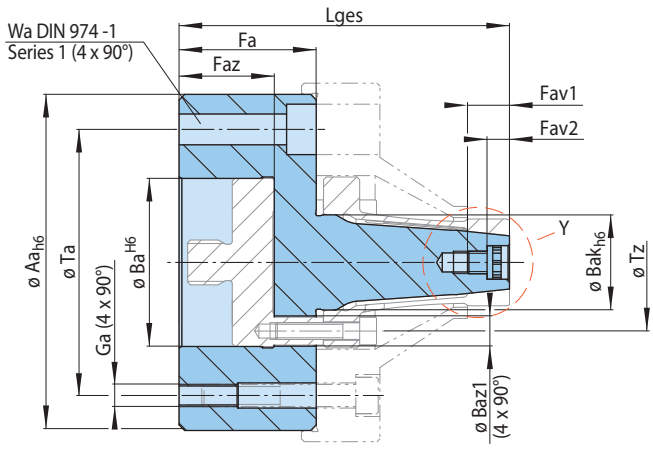
Seating body

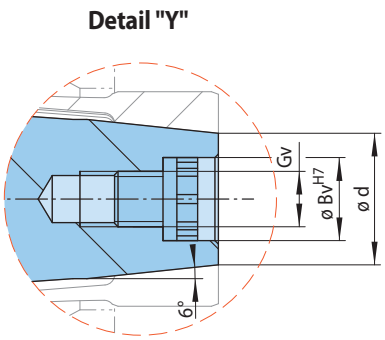




Sizes HKDF 4 to HKDF 7

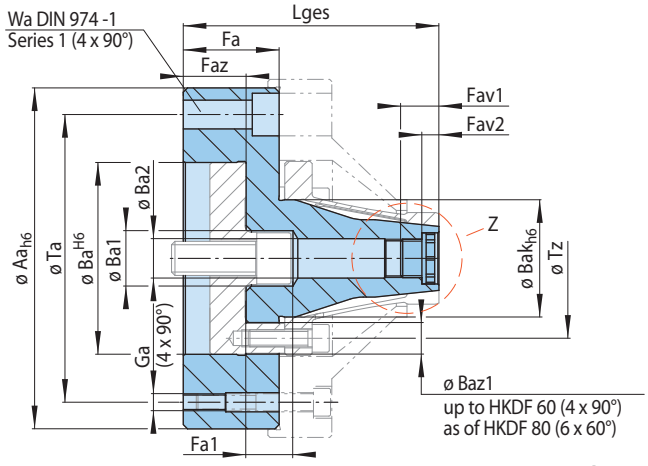
65-1

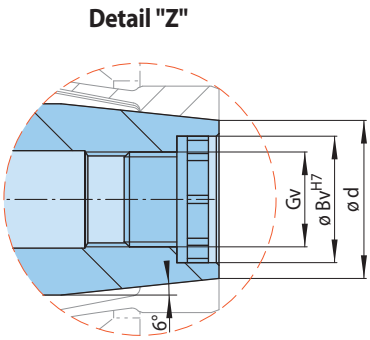




Sizes HKDF 12 and HKDF 19 with stopper plug

65-2





Sizes HKDF 30 to HKDF 125 with stopper plug

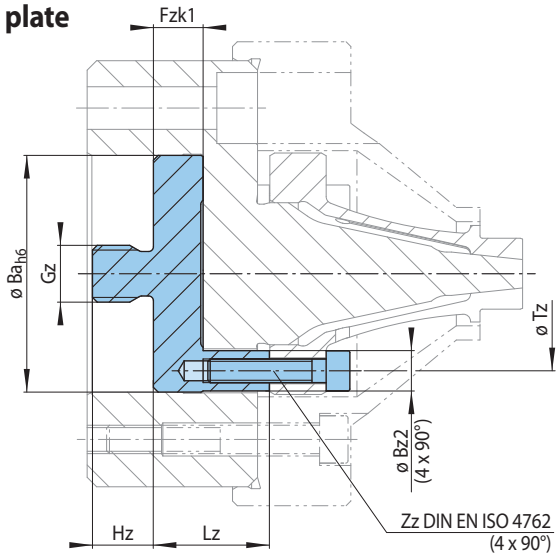
65-3

for size	Aa mm	Ba mm	Ba1 mm	Ba2 mm	Bak mm	Baz1 mm	Bv mm	d mm	Fa mm	Fa1 mm	Fav1 mm	Fav2 mm	Faz mm	Ga	Gv	Lges mm	Ta mm	Tz mm	Wa	Art.-No.
HKDF 4	90	50	-	-	30	9,2	-	4	36	-	-	-	24,5	M 6	-	92	70	41	8	2110-004900
HKDF 6	90	50	-	-	30	9,2	-	6	36	-	-	-	24,5	M 6	-	92	70	41	8	2110-006900
HKDF 7	90	50	-	-	30	9,2	-	7	36	-	-	-	24,5	M 6	-	92	70	41	8	2110-007900
HKDF 12	90	50	-	-	31	9,2	7	12	36	-	16	8	24,5	M 6	M 4	95	70	41	8	3110-012900
HKDF 19	120	60	-	-	34	10,7	12	19	49	-	20	8	34,0	M 8	M 8	118	95	49	10	3110-019900
HKDF 30	160	90	26	18,5	55	14,6	24	30	45	22	25	8	29,5	M 8	M 18x1,5	120	135	75	12	3110-030900
HKDF 40	160	90	26	18,5	55	14,6	24	40	45	22	26	8	29,5	M 8	M 18x1,5	130	135	75	12	3110-040900
HKDF 60	185	125	32	26	81	16,7	36	60	57	55	38	10	36,0	M 8	M 30	143	160	107	12	3110-060900
HKDF 80	250	175	32	26	110	19,0	60	80	68	50	38	10	44,0	M 8	M 30	172,5	225	145	12	3110-080900
HKDF 100	250	175	32	26	110	19,0	60	100	68	50	38	10	44,0	M 8	M 30	172,5	225	145	12	3110-100900
HKDF 125	275	200	32	26	135	23,0	80	125	73	50	38	10	49,0	M 8	M 30	188	250	170	12	3110-125900

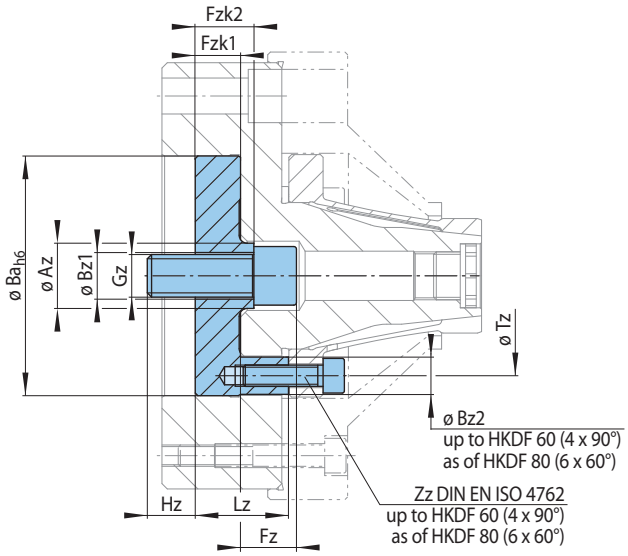
Components

for customer assembled Taper Sleeve Flange Mandrels

Draw plate



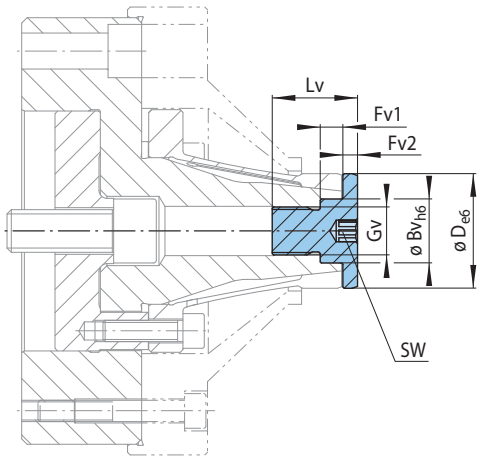
Sizes HKDF 4 to HKDF 19 66-1



Sizes HKDF 30 to HKDF 125 66-2

for size	Az mm	Ba mm	Bz1 mm	Bz2 mm	Fz mm	Fzk1 mm	Fzk2 mm	Gz	Hz mm	Lz mm	Tz mm	Zz	Art.-No. 3129-
HKDF 4	-	50	-	8,6	-	10,5	-	M 12	14	24,7	41	M 5	050901
HKDF 6	-	50	-	8,6	-	10,5	-	M 12	14	24,7	41	M 5	050901
HKDF 7	-	50	-	8,6	-	10,5	-	M 12	14	24,7	41	M 5	050901
HKDF 12	-	50	-	8,6	-	10,5	-	M 12	14	24,7	41	M 5	050901
HKDF 19	-	60	-	10,1	-	15,0	-	M 16	18	32,7	49	M 6	060901
HKDF 30	24,5	90	17,5	14,0	22	17,0	22	M 16	18	35,3	75	M 8	090901
HKDF 40	24,5	90	17,5	14,0	22	17,0	22	M 16	18	35,3	75	M 8	090901
HKDF 60	35,0	125	22,0	16,1	17	23,5	20,5	M 20	20	47,4	107	M 10	125900
HKDF 80	-	175	22	18,4	20	28,3	-	M 20	22	57,4	145	M 12	175900
HKDF 100	-	175	22	18,4	20	28,3	-	M 20	22	57,4	145	M 12	175900
HKDF 125	-	200	22	22,0	20	32,9	-	M 20	27,5	62,5	170	M 12	200900

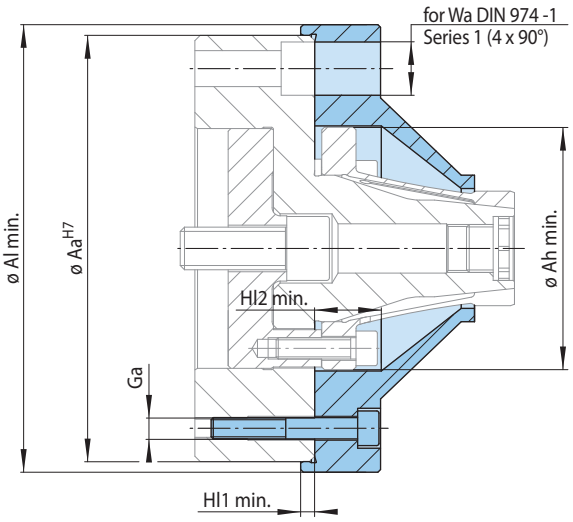
Pre-centring (optional)



66-3

for size	Bv mm	D mm	Fv1 mm	Fv2 mm	Gv	Lv mm	SW mm	Art.-No. 2150-
HKDF 4	-	-	-	-	-	-	-	-
HKDF 6	-	-	-	-	-	-	-	-
HKDF 7	-	-	-	-	-	-	-	-
HKDF 12	7	25 - 32	8,5	4,0	M 4	20	3	007901
HKDF 19	12	31 - 44	8,5	5,5	M 8	25	5	012901
HKDF 30	24	43 - 55	8,5	5,5	M 18x1,5	32	8	024902
HKDF 40	24	54 - 76	8,5	5,5	M 18x1,5	32	8	024901
HKDF 60	36	75 - 100	10,5	6,5	M 30	44	8	036901
HKDF 80	60	100 - 125	10,5	8,5	M 30	46	10	060901
HKDF 100	60	125 - 150	10,5	8,5	M 30	46	10	060901
HKDF 125	80	150 - 175	10,5	8,5	M 30	46	10	080901

Backstop ring (optional)



67-1

for size	Aa mm	Ah min. mm	Al min. mm	Ga	Hl1 min. mm	Hl2 min. mm	Wa
HKDF 4	90	52	100	M 6	6	20,0	8
HKDF 6	90	52	100	M 6	6	20,0	8
HKDF 7	90	52	100	M 6	6	20,0	8
HKDF 12	90	52	100	M 6	6	21,0	8
HKDF 19	120	62	130	M 8	6	22,0	10
HKDF 30	160	92	170	M 8	6	24,0	12
HKDF 40	160	92	170	M 8	6	24,0	12
HKDF 60	185	127	195	M 8	6	28,0	12
HKDF 80	250	171	258	M 8	6	36,5	12
HKDF 100	250	171	258	M 8	6	36,5	12
HKDF 125	275	201	283	M 8	6	40,0	12

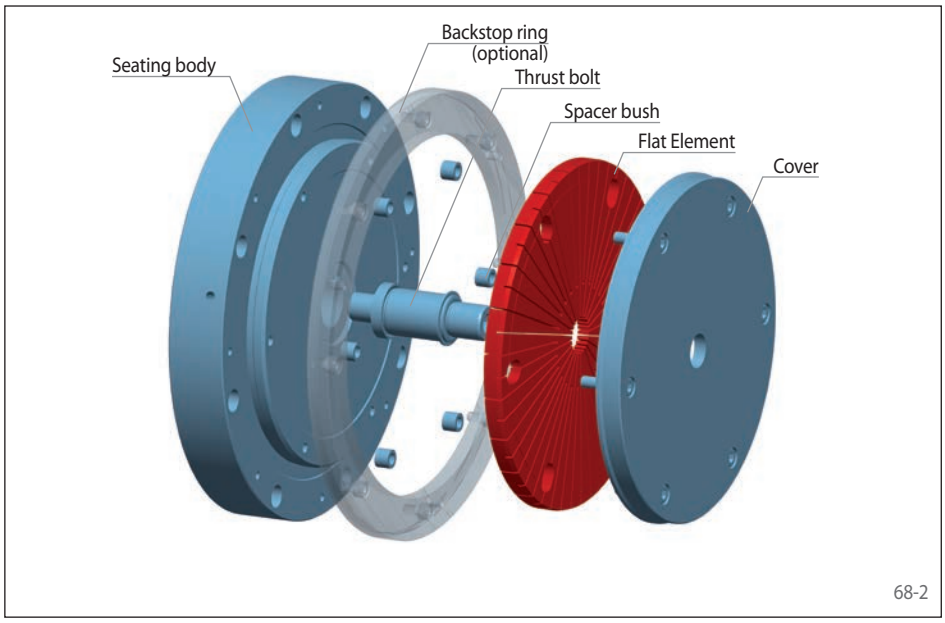
Missing dimensions reflect component geometry.

Flat Element Flange Mandrels KFDF

as Complete Clamping Fixture

Features

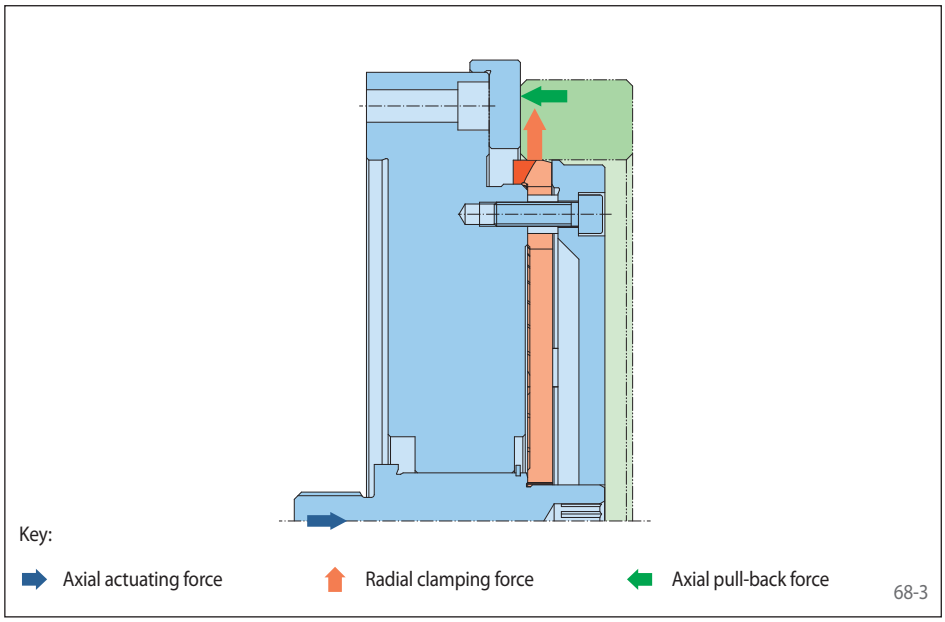
- For clamping diameters from 120 mm to 325 mm
- High true running accuracy ≤ 0,01 mm
- Permissible component tolerance up to IT11
- Very short clamping fixture length
- Short clamping length
- Pull-back against external backstop surface or optional, individually designed external backstop ring
- Hand clamping optional possible
- Rubberized slots in the Flat Element



Configuration

The Flat Element Flange Mandrel consists of a seating body, a thrust bolt, a set of spacer bushes, a Flat Element and a cover. A backstop ring and an assembly for hand clamping are optionally available. The Flat Element Flange Mandrel is attached with the seating body to the machine. The Clamping Fixture is actuated by the thrust bolt, which is connected to the machine power actuating unit.

Intermediate Flanges and Spring Force Actuators are shown starting on page 86.

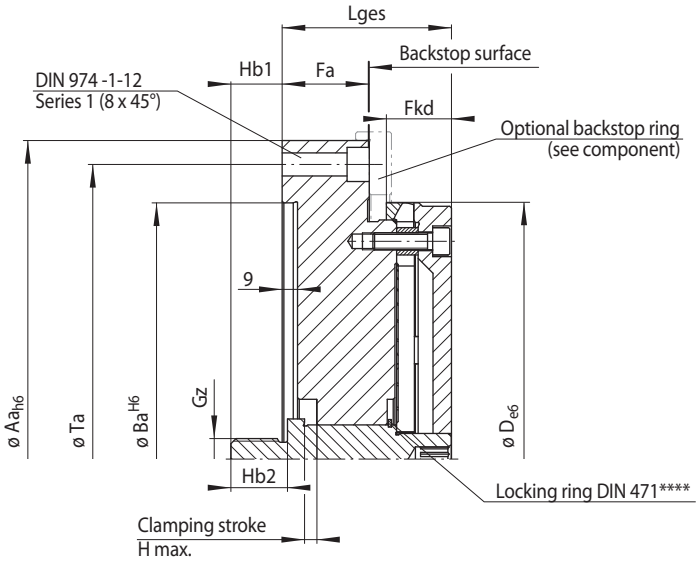


Clamping principle

The Flat Element sits pre-loaded on the seating diameter of the seating body. For clamping, the Flat Element is elastically deformed by an axial actuating force. The component is centred, pressed against the backstop and aligned flush.

Flat Element Flange Mandrels KFDF

as Complete Clamping Fixture



69-1

Size	Achievable clamping diameter D* mm	Maximum diameter change** ΔD mm	Max. transmissible torque*** M Nm	Max. Actuating force*** F N	Aa mm	Ba mm	Fa mm	Fkd mm	Gz	H max. mm	Hb1 mm	Hb2 mm	Lges mm	Ta mm
KFDF 110	120 - 130	0,28	620	13700	200	125	32	23	M 16	3,4	16,5	22	63,1	175
KFDF 120	130 - 145	0,30	760	13700	200	125	32	23	M 16	3,8	16,5	22	63,1	175
KFDF 130	145 - 155	0,30	1230	19600	200	125	40	27	M 20	4,0	21,0	26	75,1	175
KFDF 140	155 - 170	0,34	1350	19600	250	175	40	27	M 20	4,5	21,0	26	75,1	225
KFDF 155	170 - 185	0,37	1500	19600	250	175	40	29	M 20	5,1	21,0	26	77,1	225
KFDF 170	185 - 200	0,43	1600	19600	250	175	40	29	M 20	5,8	21,0	26	77,1	225
KFDF 185	200 - 220	0,47	1800	19600	275	200	40	29	M 20	6,4	21,0	26	77,1	250
KFDF 200	220 - 240	0,50	2850	29400	315	240	51	34	M 24	6,7	30,0	30	95,1	280
KFDF 220	240 - 260	0,57	3150	29400	315	240	51	34	M 24	7,8	30,0	30	95,1	280
KFDF 240	260 - 280	0,64	3450	29400	375	300	51	34	M 24	8,5	30,0	30	95,1	345
KFDF 260	280 - 300	0,70	3700	29400	375	300	51	34	M 24	9,4	30,0	30	95,1	345
KFDF 280	300 - 325	0,75	4100	29400	375	300	51	38	M 24	10,2	30,0	30	99,1	345

* Clamping diameter adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element. • *** for clamping with pull-back action.
**** The locking ring prevents loss of the pressure bolt during transport and storage of the Clamping Fixture. It must be removed prior to installation and commissioning.

Example for ordering

Please indicate the size of the Clamping Fixture and the clamping diameter of your component, including component tolerance, in your order:

Size:	KFDF 120
Clamping diameter:	140,47 mm
Component tolerance:	H7

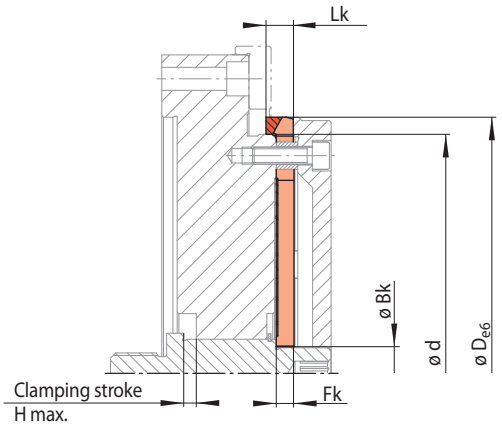
➡ KFDF 120-140,47H7

Customer assembly

The Flat Elements and components shown on pages 70 to 73 are available for customer assembled Flat Element Flange Mandrels.

Clamping Elements Flat Elements KFD

for customer assembled Flat Element Flange Mandrels for setup to different clamping diameters within a given size



70-1

Size KFD … d mm	Achievable clamping diameter D* mm	Maximum diameter change** Δ D mm	Max. transmissible torque*** M Nm	Max. Actuating force*** F N	Bk mm	Fk mm	H max. **** mm	Lk mm	Art.-No. 1192-
35	41 - 47	0,15	38	5900	10,5	3	0,8	6	035004
40	47 - 55	0,15	52	5700	10,5	3	0,9	6	040004
46	54 - 62	0,20	89	9800	12,5	4	1,1	8	046004
52	60 - 72	0,20	120	9500	12,5	4	1,3	8	052004
62	70 - 80	0,21	170	9200	12,5	4	1,7	8	062004
72	80 - 90	0,21	235	8900	12,5	4	2,1	8	072004
80	90 - 100	0,27	340	14200	16,5	5	2,2	10	080004
90	100 - 110	0,27	450	14200	16,5	5	2,6	10	090004
100	110 - 120	0,28	560	14200	16,5	5	3,1	10	100004
110	120 - 130	0,28	620	13700	16,5	5	3,4	10	110004
120	130 - 145	0,30	760	13700	16,5	5	3,8	10	120002
130	145 - 155	0,30	1230	19600	21,0	6	4,0	12	130002
140	155 - 170	0,34	1350	19600	21,0	6	4,5	12	140002
155	170 - 185	0,37	1500	19600	21,0	6	5,1	12	155002
170	185 - 200	0,43	1600	19600	21,0	6	5,8	12	170002
185	200 - 220	0,47	1800	19600	21,0	6	6,4	12	185002
200	220 - 240	0,50	2850	29400	31,5	8	6,7	14	200002
220	240 - 260	0,57	3150	29400	31,5	8	7,8	14	220002
240	260 - 280	0,64	3450	29400	31,5	8	8,5	14	240002
260	280 - 300	0,70	3700	29400	31,5	8	9,4	14	260002
280	300 - 325	0,75	4100	29400	32,0	10	10,2	16	280002
300	325 - 350	0,80	4500	29400	32,0	10	11,3	16	300002
325	350 - 375	0,80	5300	29400	32,0	10	12,5	16	325002
350	375 - 400	0,80	5800	29400	52,0	10	12,7	16	350002
375	400 - 425	0,85	6300	29400	52,0	10	13,7	16	375002
400	425 - 455	0,95	6500	29400	52,0	10	15,0	16	400002
425	455 - 485	1,00	6000	24500	52,0	12	16,1	18	425002
455	485 - 520	1,05	6600	24500	52,0	12	17,1	18	455002
490	520 - 560	1,10	7200	24500	52,0	12	18,3	18	490002

* Clamping diameter adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element. • *** for clamping with pull-back action.
**** Clamping stroke H max. describes the load limit of the Clamping Element while activation without component.

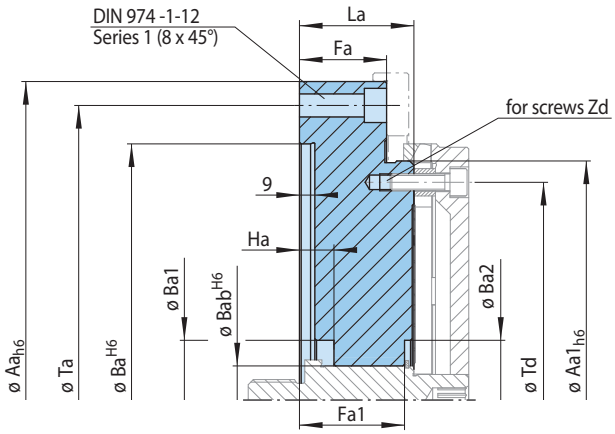
Example for ordering

Please indicate the size of the Clamping Element and the clamping diameter of your component, including component tolerance, in your order:

Size:	KFD 40
Clamping diameter:	50,47 mm
Component tolerance:	H7

➡ KFD 40-50,47H7

Seating body

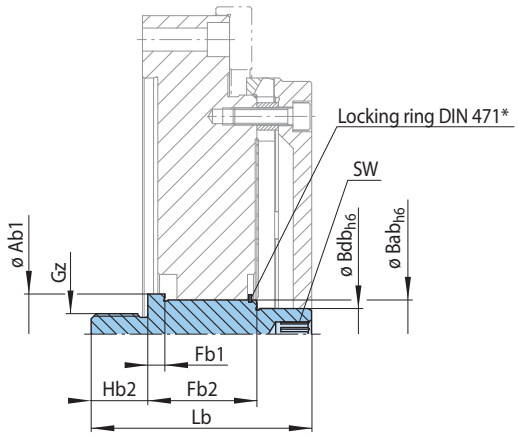


71-1

for size	Aa mm	Aa1 mm	Ba mm	Ba1 mm	Ba2 mm	Bab mm	Fa mm	Fa1 mm	Ha mm	La mm	Ta mm	Td mm	Y*	Zd	Art.-No. 2107-
KFDF 110	200	110	125	30	30	22	32	41,0	15,9	45	175	95	3	M 5	110900
KFDF 120	200	120	125	30	30	22	32	41,0	16,3	45	175	104	3	M 5	120900
KFDF 130	200	130	125	40	40	28	40	48,5	17,0	54	175	113	4	M 5	130900
KFDF 140	250	140	175	40	40	28	40	48,5	17,5	54	225	123	4	M 5	140900
KFDF 155	250	155	175	40	40	28	40	48,5	18,1	54	225	138	4	M 5	155900
KFDF 170	250	170	175	40	40	28	40	48,5	18,8	54	225	151	4	M 6	170900
KFDF 185	275	185	200	40	40	28	40	48,5	19,4	54	250	164	4	M 6	185900
KFDF 200	315	200	240	70	70	40	51	61,5	16,7	67	280	179	4	M 6	200900
KFDF 220	315	220	240	70	70	40	51	61,5	17,8	67	280	200	4	M 6	220900
KFDF 240	375	240	300	70	70	40	51	61,5	18,5	67	345	216	4	M 8	240900
KFDF 260	375	260	300	70	70	40	51	61,5	19,4	67	345	236	4	M 8	260900
KFDF 280	375	280	300	70	70	40	51	61,5	20,2	67	345	255	6	M 10	280900

* Y = Number of threaded holes Zd on pitch circle diameter Td

Thrust bolt with locking ring

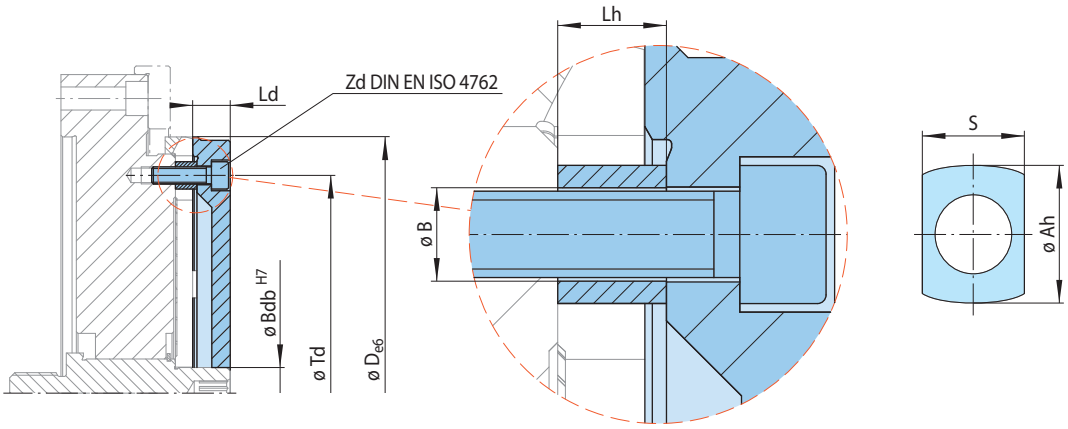


71-2

for size	Ab1 mm	Bab mm	Bdb mm	Fb1 mm	Fb2 mm	Gz	Hb2 mm	Lb mm	SW mm	Art.-No. 3154-
KFDF 110	28	22	16	7	39,5	M 16	22	79	8	028920
KFDF 120	28	22	16	7	39,5	M 16	22	79	8	028920
KFDF 130	37	28	20	8	49,0	M 20	26	98	10	037920
KFDF 140	37	28	20	8	49,0	M 20	26	98	10	037920
KFDF 155	37	28	20	8	49,0	M 20	26	98	10	037920
KFDF 170	37	28	20	8	49,0	M 20	26	98	10	037920
KFDF 185	37	28	20	8	49,0	M 20	26	98	10	037920
KFDF 200	47	40	30	10	67,0	M 24	30	129	14	047920
KFDF 220	47	40	30	10	67,0	M 24	30	129	14	047920
KFDF 240	47	40	30	10	67,0	M 24	30	129	14	047920
KFDF 260	47	40	30	10	67,0	M 24	30	129	14	047920
KFDF 280	47	40	30	10	67,0	M 24	30	129	14	047920

* The locking ring prevents loss of the pressure bolt during transport and storage of the Clamping Fixture. It must be removed prior to installation and commissioning.

Cover with spacer bushes and cylinder screws

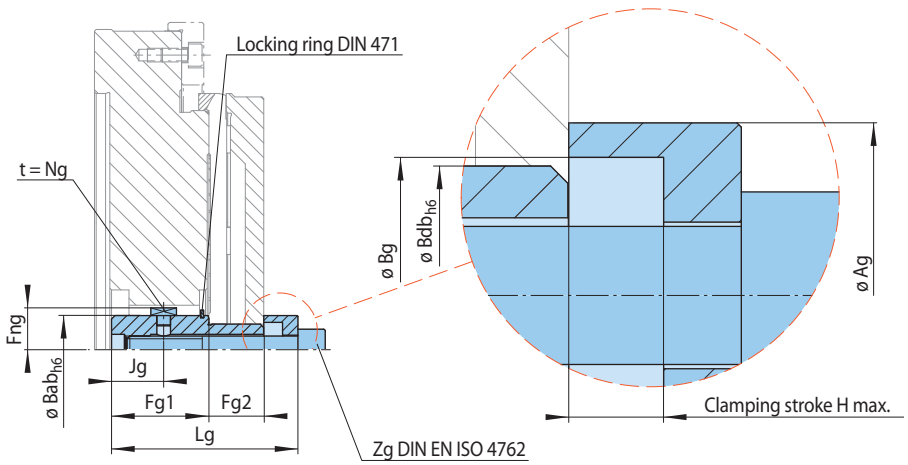


72-1

for size	Ah mm	B mm	Bdb mm	D mm	Ld mm	Lh* mm	S mm	Td mm	Y*	Zd	Art.-No. 3127-
KFDF 110	10	5,2	16	120 - 130	13	7,1	6,5	95	3	M 5	110900
KFDF 120	10	5,2	16	130 - 145	13	7,1	6,5	104	3	M 5	120900
KFDF 130	10	5,2	20	145 - 155	15	8,1	6,5	113	4	M 5	130900
KFDF 140	10	5,2	20	155 - 170	15	8,1	6,5	123	4	M 5	140900
KFDF 155	10	5,2	20	170 - 185	17	8,1	6,5	138	4	M 5	155900
KFDF 170	10	6,2	20	185 - 200	17	8,2	7,5	151	4	M 6	170900
KFDF 185	12	6,2	20	200 - 220	17	8,7	8,5	164	4	M 6	185900
KFDF 200	12	6,2	30	220 - 240	20	10,7	8,5	179	4	M 6	200900
KFDF 220	12	6,2	30	240 - 260	20	10,7	8,5	200	4	M 6	220900
KFDF 240	14	8,2	30	260 - 280	20	10,7	10,5	216	4	M 8	240900
KFDF 260	14	8,2	30	280 - 300	20	10,7	10,5	236	4	M 8	260900
KFDF 280	16	10,2	30	300 - 325	22	13,2	-	255	6	M 10	280900

* Y = Number of spacer bushes on pitch circle diameter Td

Assembly group for hand clamping (optional)

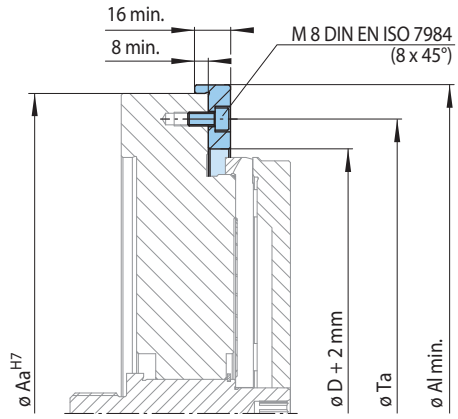


72-2

for size	Ag mm	Bab mm	Bdb mm	Bg mm	Fg1 mm	Fg2 mm	Fng mm	H max.* mm	Jg mm	Lg mm	Ng mm	Zg	Art.-No. 3145-
KFDF 110	22	22	16	17	32,5	17,5	13,3	3,4	17,5	58,6	5	M 10	022900
KFDF 120	22	22	16	17	32,5	17,5	13,3	3,8	17,5	58,6	5	M 10	022900
KFDF 130	32	28	20	22	41,0	23,0	18,5	4,0	23,0	73,1	8	M 12	028900
KFDF 140	32	28	20	22	41,0	23,0	18,5	4,5	23,0	73,1	8	M 12	028900
KFDF 155	32	28	20	22	41,0	23,0	18,5	5,1	23,0	75,1	8	M 12	028900
KFDF 170	32	28	20	22	41,0	23,0	18,5	5,8	23,0	75,1	8	M 12	028900
KFDF 185	32	28	20	22	41,0	23,0	18,5	6,4	23,0	75,1	8	M 12	028900
KFDF 200	40	40	30	32	57,0	32,0	24,5	6,7	30,5	105,1	8	M 16	040900
KFDF 220	40	40	30	32	57,0	32,0	24,5	7,8	30,5	105,1	8	M 16	040900
KFDF 240	40	40	30	32	57,0	32,0	24,5	8,5	30,5	105,1	8	M 16	040900
KFDF 260	40	40	30	32	57,0	32,0	24,5	9,4	30,5	105,1	8	M 16	040900
KFDF 280	40	40	30	32	57,0	32,0	24,5	10,2	30,5	109,1	8	M 16	040900

* Clamping stroke H max. describes the load limit of the Clamping Element while activation without component.

Backstop ring (optional)



ø D = Achievable clamping diameter

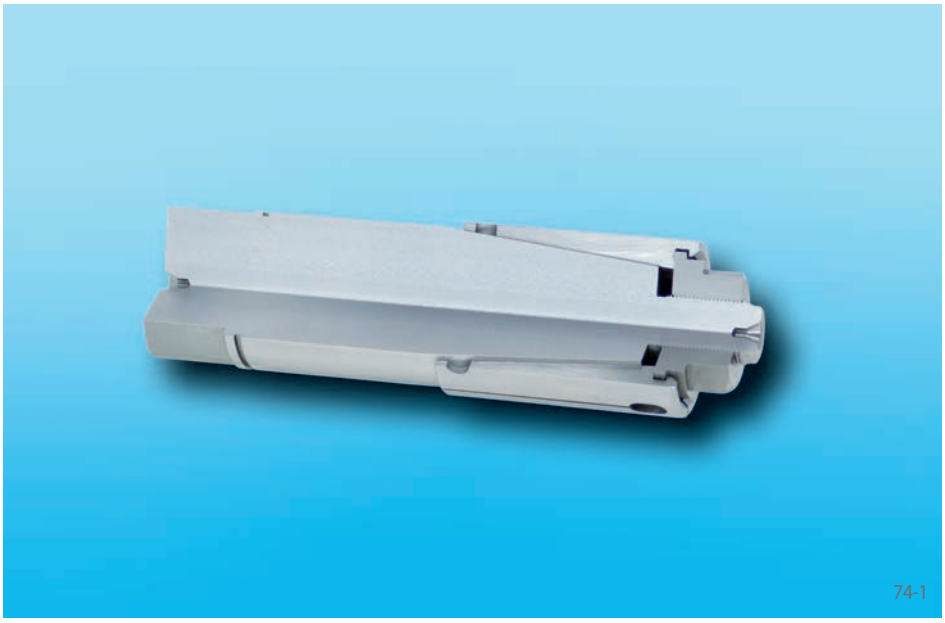
73-1

for size	Aa mm	Al min. mm	D mm	Ta mm
KFDF 110	200	210	120 - 130	175
KFDF 120	200	210	130 - 145	175
KFDF 130	200	210	145 - 155	175
KFDF 140	250	260	155 - 170	225
KFDF 155	250	260	170 - 185	225
KFDF 170	250	260	185 - 200	225
KFDF 185	275	285	200 - 220	250
KFDF 200	315	325	220 - 240	280
KFDF 220	315	325	240 - 260	280
KFDF 240	375	385	260 - 280	345
KFDF 260	375	385	280 - 300	345
KFDF 280	375	385	300 - 325	345

Missing dimensions reflect component geometry.

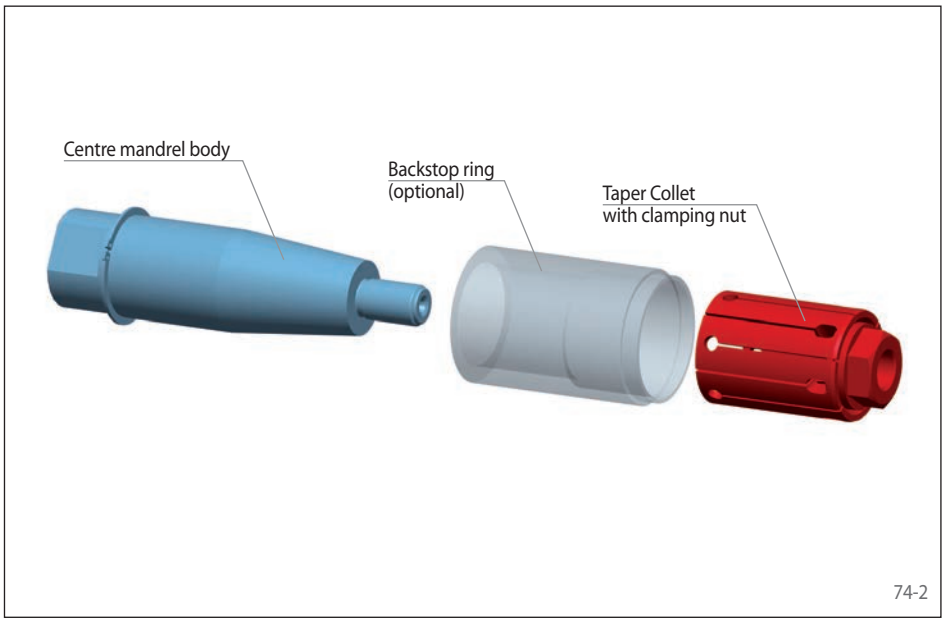
Taper Collet Centre Mandrel BKDI

as Complete Clamping Fixture



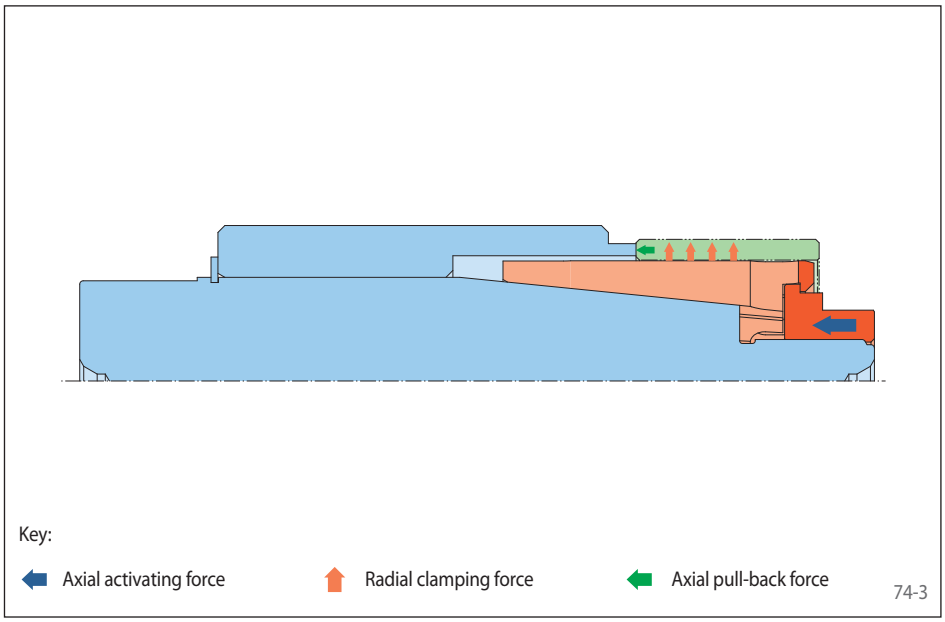
Features

- For clamping diameters from 11,9 mm to 129,6 mm
- High true running accuracy ≤ 0,01 mm
- Permissible component tolerance up to IT15
- Pull-back against an optional, individually designed external backstop ring
- For thin-walled or solid components
- For hand clamping



Configuration

The Taper Collet Centre Mandrel consists of a centre mandrel body and a Taper Collet with a clamping nut. A plain ground backstop pin is also available as an option. The Taper Collet Centre Mandrel is mounted between the centring tips. The Taper Collet is activated by turning the clamping nut.



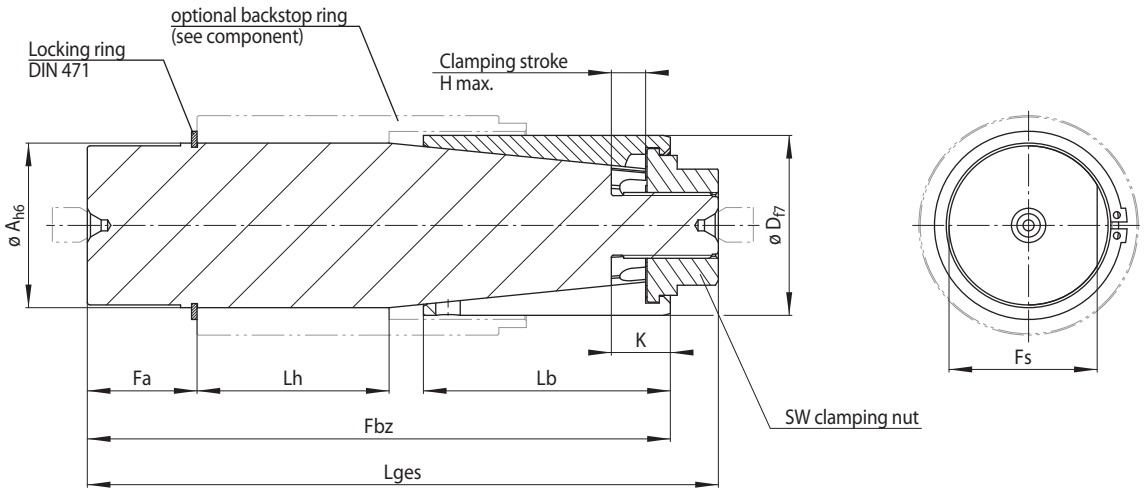
Clamping principle

For clamping, the Taper Collet is pulled against the centre mandrel body. The component is centred, pressed against the optional backstop and aligned flush.

The cylindrical form of the component bore in the clamping area has to be smaller than the tolerance class IT7, independent of the component bore tolerance.

Taper Collet Centre Mandrel BKDI

as Complete Clamping Fixture



75-1

Size	Clamping range D[1) mm	Maximum diameter change* Δ D mm	Max. transmissible torque** M Nm	Tightening torque** M_H Nm	A mm	Fa mm	Fbz mm	Fs mm	H max. mm	K mm	Lb mm	Lges mm	Lh mm	SW mm
BKDI 6	11,90 - 15,00	0,6	11	5	11	17,0	70,3	9	3	8	23	77	25,6	11
BKDI 7	14,70 - 20,90	1,2	13	7	14	17,0	83	11	6	11	35	90	25,0	11
BKDI 12	20,70 - 27,90	1,2	44	25	20	21,2	102	17	6	12	45	110	29,8	17
BKDI 18	27,70 - 32,80	1,2	58	37	26	21,2	102	22,5	6	12	45	110	30,8	17
BKDI 19	32,60 - 42,80	1,2	114	67	30	28,5	147	25	6	13	65	160	47,5	27
BKDI 27	42,60 - 51,80	1,2	147	78	39	28,7	147	34	6	13	65	160	47,2	27
BKDI 32	51,60 - 64,00	2,4	273	153	49	39,7	212	43	12	22	90	230	70,2	41
BKDI 43	63,60 - 72,00	2,4	333	175	60	40,0	212	54	12	22	90	230	70,0	41
BKDI 44	71,60 - 82,00	2,4	373	204	66	48,5	277	59	12	22	120	300	96,5	55
BKDI 54	81,60 - 132,00	2,4	424	222	77	48,5	277	68	12	22	120	300	96,5	55

[1) Please note the standard clamping ranges according to the tables on the next pages „Clamping Elements Taper Collets BMD".
* of the clamping diameter of the Clamping Element.
** for clamping with pull-back action.

Example for ordering

Please indicate the size of the Clamping Fixture and the clamping range of the requested Taper Collet, in your order:

Size:	BKDI 12
Clamping range:	23,70 - 24,90 mm

➡ BKDI 12-23,70-24,90

Insertion depth

The minimum insertion depth $Le_{min.}$ is derived according to the following formula from the component chamfer length Lf and dimension K:

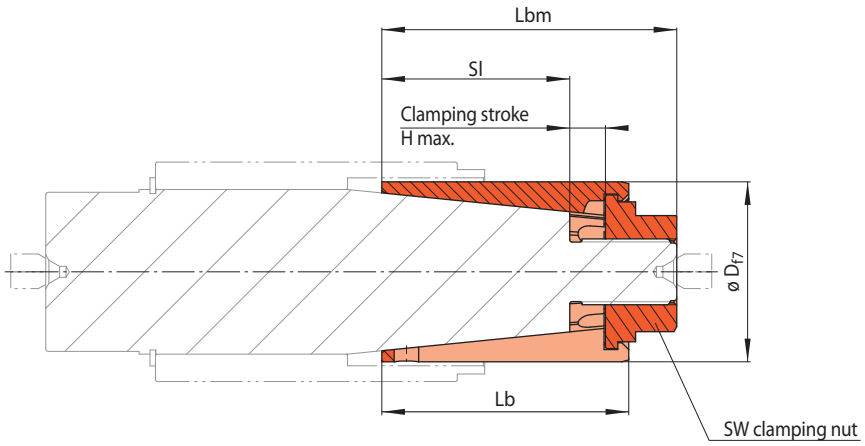
$Le_{min.} = K + Lf$

Customer assembly

The Taper Collets and components shown on pages 76 to 78 are available for customer assembled Taper Collet Centre Mandrels.

Clamping Elements Taper Collets with clamping nut BMD

for customer assembled Taper Collet Centre Mandrels for setup to different clamping diameters within a given size



76-1

Example for ordering

Please indicate the size of the Clamping Element and the clamping range of the requested Taper Collet, in your order:

Size:	BMD 6
Clamping range:	13,40 - 14,00 mm

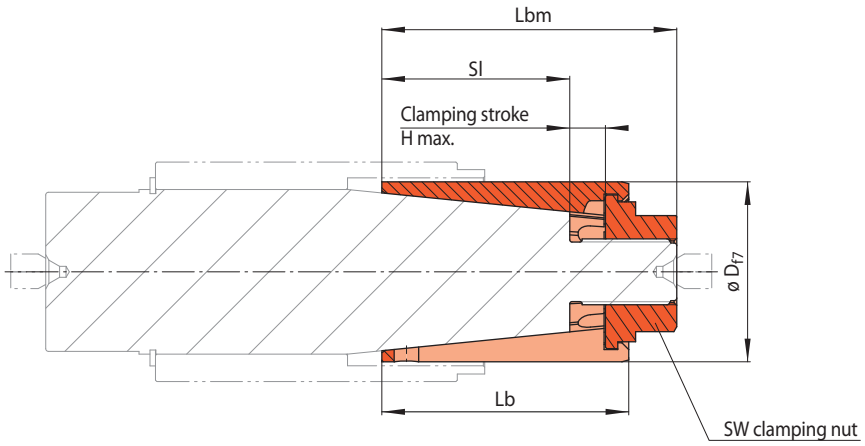
➡ BMD 6-13,40-14,00

Size BMD …	Clamping range[1)] D mm	Max. transmissible torque* M Nm	Tightening torque* M_H Nm	H max.** mm	Lb mm	Lbm mm	Sl mm	SW mm	Art.-No. 3198-
6	11,90 - 12,50	11	7	3	23	29,7	15	11	006102-011.90
	12,40 - 13,00	11	7	3	23	29,7	15	11	006102-012.40
	12,90 - 13,50	11	7	3	23	29,7	15	11	006102-012.90
	13,40 - 14,00	11	7	3	23	29,7	15	11	006102-013.40
	13,90 - 14,50	11	7	3	23	29,7	15	11	006102-013.90
	14,40 - 15,00	11	7	3	23	29,7	15	11	006102-014.40
7	14,70 - 15,90	13	8	6	35	42	24	11	007102-014.70
	15,70 - 16,90	13	8	6	35	42	24	11	007102-015.70
	16,70 - 17,90	13	8	6	35	42	24	11	007102-016.70
	17,70 - 18,90	13	8	6	35	42	24	11	007102-017.70
	18,70 - 19,90	13	8	6	35	42	24	11	007102-018.70
	19,70 - 20,90	13	8	6	35	42	24	11	007102-019.70
12	20,70 - 21,90	44	28	6	45	53	33	17	012102-020.70
	21,70 - 22,90	44	28	6	45	53	33	17	012102-021.70
	22,70 - 23,90	44	28	6	45	53	33	17	012102-022.70
	23,70 - 24,90	44	28	6	45	53	33	17	012102-023.70
	24,70 - 25,90	44	28	6	45	53	33	17	012102-024.70
	25,70 - 26,90	44	28	6	45	53	33	17	012102-025.70
	26,70 - 27,90	44	28	6	45	53	33	17	012102-026.70
18	27,70 - 28,90	58	37	6	45	53	33	17	018103-027.70
	28,70 - 29,90	58	37	6	45	53	33	17	018103-028.70
	29,70 - 30,90	58	37	6	45	53	33	17	018103-029.70
	30,60 - 31,80	58	37	6	45	53	33	17	018103-030.60
	31,60 - 32,80	58	37	6	45	53	33	17	018103-031.60
19	32,60 - 33,80	114	73	6	65	78	52	27	018104-032.60
	33,60 - 34,80	114	73	6	65	78	52	27	018104-033.60
	34,60 - 35,80	114	73	6	65	78	52	27	018104-034.60
	35,60 - 36,80	114	73	6	65	78	52	27	018104-035.60
	36,60 - 37,80	114	73	6	65	78	52	27	018104-036.60
	37,60 - 38,80	114	73	6	65	78	52	27	018104-037.60
	38,60 - 39,80	114	73	6	65	78	52	27	018104-038.60
	39,60 - 40,80	114	73	6	65	78	52	27	018104-039.60
	40,60 - 41,80	114	73	6	65	78	52	27	018104-040.60
	41,60 - 42,80	114	73	6	65	78	52	27	018104-041.60
27	42,60 - 43,80	147	95	6	65	78	52	27	027102-042.60
	43,60 - 44,80	147	95	6	65	78	52	27	027102-043.60
	44,60 - 45,80	147	95	6	65	78	52	27	027102-044.60
	45,60 - 46,80	147	95	6	65	78	52	27	027102-045.60
	46,60 - 47,80	147	95	6	65	78	52	27	027102-046.60
	47,60 - 48,80	147	95	6	65	78	52	27	027102-047.60
	48,60 - 49,80	147	95	6	65	78	52	27	027102-048.60
	49,60 - 50,80	147	95	6	65	78	52	27	027102-049.60
	50,60 - 51,80	147	95	6	65	78	52	27	027102-050.60

* for clamping with pull-back action. • ** Clamping stroke H max. describes the load limit of the clamping element while activation without component. • [1)] Other clamping ranges available on short notice by request

Clamping Elements Taper Collets with clamping nut BMD

for customer assembled Taper Collet Centre Mandrels for setup to different clamping diameters within a given size



77-1

Example for ordering

Please indicate the size of the Clamping Element and the clamping range of the requested Taper Collet, in your order:

Size:	BMD 32
Clamping range:	57,60 - 60,00 mm

➡ BMD 32-57,60-60,00

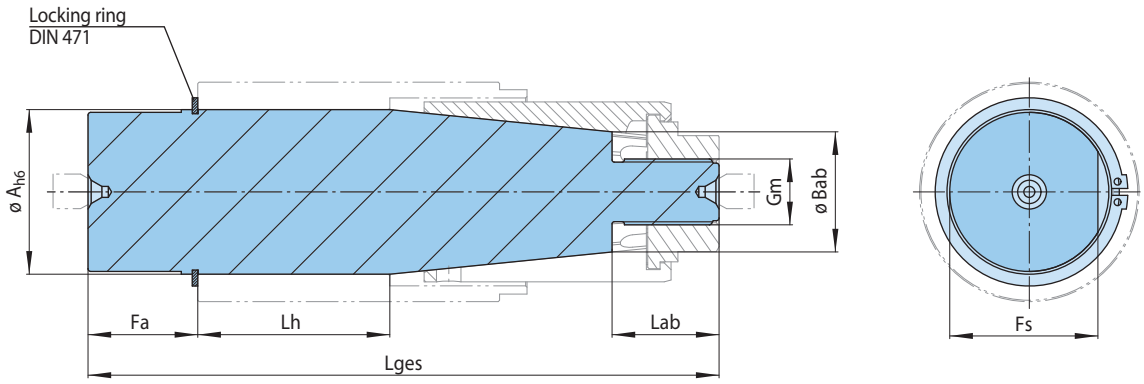
Size BMD …	Clamping range[1)] D mm	Max. transmissible torque* M Nm	Tightening torque* M_H Nm	H max.** mm	Lb mm	Lbm mm	Sl mm	SW mm	Art.-No. 3198-
32	51,60 - 54,00	273	170	12	90	108	68	41	032102-051.60
	53,60 - 56,00	273	170	12	90	108	68	41	032102-053.60
	55,60 - 58,00	273	170	12	90	108	68	41	032102-055.60
	57,60 - 60,00	273	170	12	90	108	68	41	032102-057.60
	59,60 - 62,00	273	170	12	90	108	68	41	032102-059.60
	61,60 - 64,00	273	170	12	90	108	68	41	032102-061.60
43	63,60 - 66,00	333	214	12	90	108	68	41	043103-063.60
	65,60 - 68,00	333	214	12	90	108	68	41	043103-065.60
	67,60 - 70,00	333	214	12	90	108	68	41	043103-067.60
	69,60 - 72,00	333	214	12	90	108	68	41	043103-069.60
44	71,60 - 74,00	373	227	12	120	143	98	55	043104-071.60
	73,60 - 76,00	373	227	12	120	143	98	55	043104-073.60
	75,60 - 78,00	373	227	12	120	143	98	55	043104-075.60
	77,60 - 80,00	373	227	12	120	143	98	55	043104-077.60
	79,60 - 82,00	373	227	12	120	143	98	55	043104-079.60
54	81,60 - 84,00	424	265	12	120	143	98	55	054102-081.60
	83,60 - 86,00	424	265	12	120	143	98	55	054102-083.60
	85,60 - 88,00	424	265	12	120	143	98	55	054102-085.60
	87,60 - 90,00	424	265	12	120	143	98	55	054102-087.60
	89,60 - 92,00	424	265	12	120	143	98	55	054102-089.60
	91,60 - 94,00	424	265	12	120	143	98	55	054102-091.60
	93,60 - 96,00	424	265	12	120	143	98	55	054102-093.60
	95,60 - 98,00	424	265	12	120	143	98	55	054102-095.60
	97,60 - 100,00	424	265	12	120	143	98	55	054102-097.60
	99,60 - 102,00	424	265	12	120	143	98	55	054102-099.60
	101,60 - 104,00	424	265	12	120	143	98	55	054106-101.60
	103,60 - 106,00	424	265	12	120	143	98	55	054106-103.60
	105,60 - 108,00	424	265	12	120	143	98	55	054106-105.60
	107,60 - 110,00	424	265	12	120	143	98	55	054106-107.60
	109,60 - 112,00	424	265	12	120	143	98	55	054106-109.60
	111,60 - 114,00	424	265	12	120	143	98	55	054107-111.60
	113,60 - 116,00	424	265	12	120	143	98	55	054107-113.60
	115,60 - 118,00	424	265	12	120	143	98	55	054107-115.60
	117,60 - 120,00	424	265	12	120	143	98	55	054107-117.60
	119,60 - 122,00	424	265	12	120	143	98	55	054107-119.60
	121,60 - 124,00	424	265	12	120	143	98	55	054108-121.60
	123,60 - 126,00	424	265	12	120	143	98	55	054108-123.60
	125,60 - 128,00	424	265	12	120	143	98	55	054108-125.60
	127,60 - 130,00	424	265	12	120	143	98	55	054108-127.60
	129,60 - 132,00	424	265	12	120	143	98	55	054108-129.60

* for clamping with pull-back action. • ** Clamping stroke H max. describes the load limit of the clamping element while activation without component. • [1)] Other clamping ranges available on short notice by request

Components

for customer assembled Taper Collet Centre Mandrels

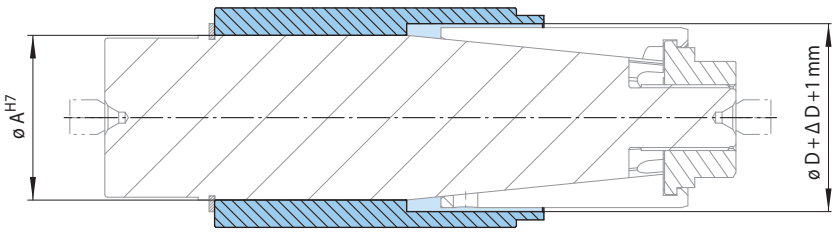
Centre mandrel body with locking ring



78-1

for size	A mm	Bab mm	Fa mm	Fs mm	Gm	Lab mm	Lges mm	Lh mm	Art.-No. 2110-
BKDI 6	11	7,2	17,0	9	M 5 x 0,5	15,6	77	25,6	007017
BKDI 7	14	7,8	17,0	11	M 6 x 0,75	17	90	25,0	007006
BKDI 12	20	12	21,2	17	M 10 x 1	19	110	29,8	012002
BKDI 18	26	18,2	21,2	22,5	M 10 x 1	19	110	30,8	018006
BKDI 19	30	18,2	28,5	25	M 16 x 1,5	25	160	47,5	018009
BKDI 27	39	27,2	28,8	34	M 16 x 1,5	25	160	47,3	027004
BKDI 32	49	32,8	39,8	43	M 24 x 1,5	39	230	70,3	032002
BKDI 43	60	43,8	40,0	54	M 24 x 1,5	39	230	70,0	043001
BKDI 44	66	43,8	48,5	59	M 30 x 1,5	44	300	96,5	043002
BKDI 54	77	54,8	48,5	68	M 30 x 1,5	44	300	96,5	054001

Backstop ring (optional)



ø D = Clamping diameter
Δ D = Maximum diameter change of the clamping diameter of the Clamping Element

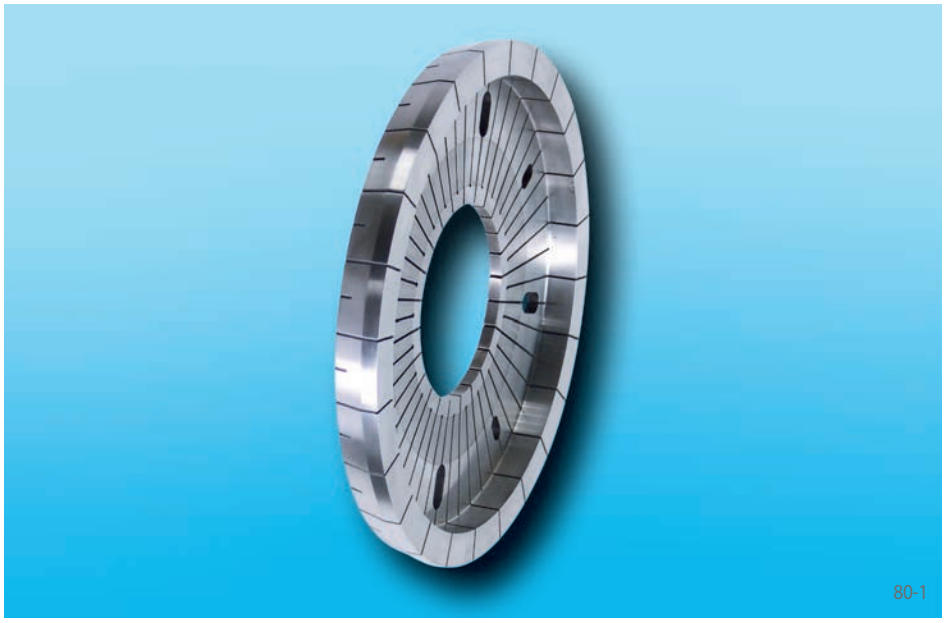
78-2

for size	A mm
BKDI 6	11
BKDI 7	14
BKDI 12	20
BKDI 18	26
BKDI 19	30
BKDI 27	39
BKDI 32	49
BKDI 43	60
BKDI 44	66
BKDI 54	77

Notes / sketches

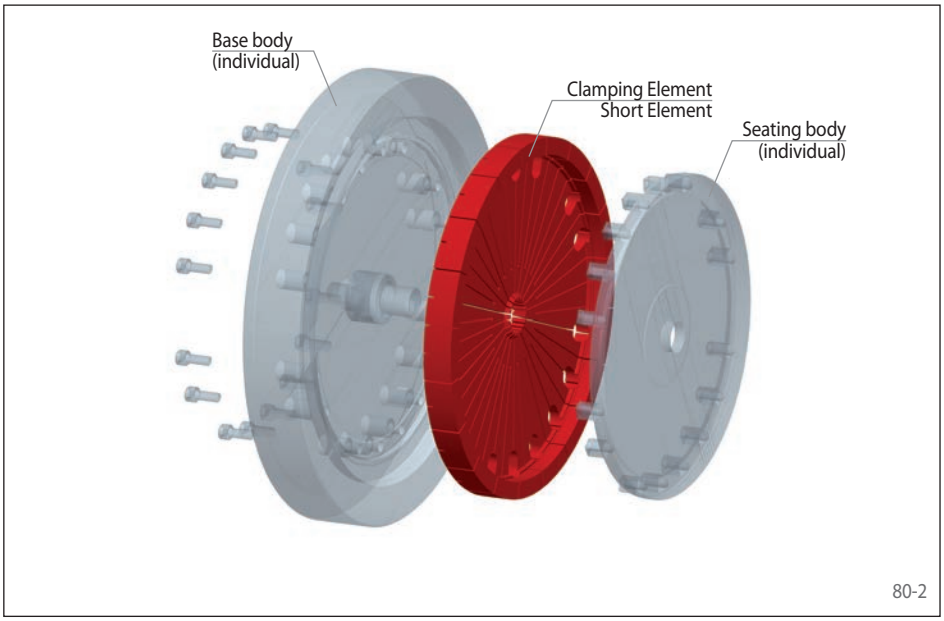
Clamping Elements Short Elements KUD

for customer assembled Short Element Clamping Mandrels for setup to different clamping diameters within a given size



Features

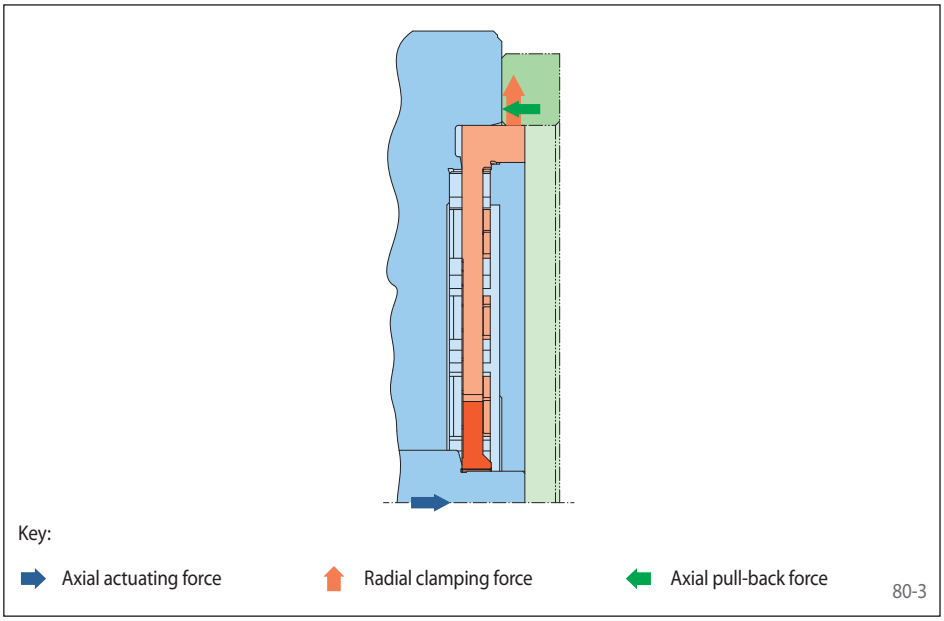
- For clamping diameters from 70 mm to 200 mm
- High true running accuracy ≤ 0,01 mm
- Permissible component tolerance up to IT11
- Very short clamping fixture length
- Pull-back possible
- Rubberized slots in the Short Element
- For blind bores ≥ 2 mm
- Clamping in the smallest centrings and blind bores
- Simple configuration
- Long service life
- Setup to different clamping diameters within a given size by simple change of the Clamping Element



Configuration

The Clamping Element Short Element is an adaptation of the Clamping Element Flat Element designed for clamping in the smallest centrings and blind bores.

Short Element Clamping Mandrels are produced individually according to customer specification. To order these fixtures, please complete the questionnaire on page 119 and send it to us.

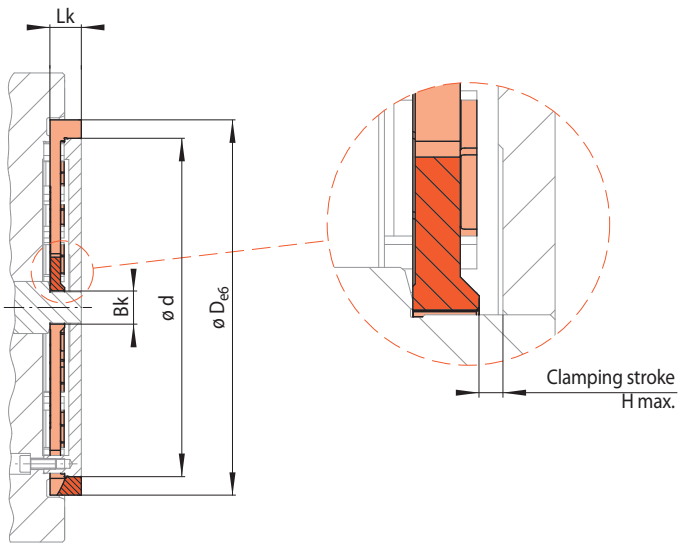


Clamping principle

The Short Element sits pre-loaded on the seating diameter of the seating body. For clamping, the Short Element is elastically deformed by an axial actuating force. The component is centred, pressed against the backstop and aligned flush.

Clamping Elements Short Elements KUD

for customer assembled Short Element Clamping Mandrels for setup to different clamping diameters within a given size



81-1

Size KUD … d mm	Achievable clamping diameter D* mm	Maximum diameter change** Δ D mm	Max. transmissible torque*** M Nm	Max. Actuating force*** F N	Bk mm	H max. **** mm	Lk mm	Art.-No. 1193-
62	70 - 80	0,21	93	5390	12	1,7	12	062002
72	80 - 90	0,21	157	6350	12	2,1	12	072002
80	90 - 100	0,27	235	9800	16	2,2	16	080002
90	100 - 110	0,27	300	9800	16	2,6	16	090002
100	110 - 120	0,28	360	9300	16	3,1	17	100002
110	120 - 130	0,28	480	10750	16	3,4	17	110002
120	130 - 145	0,30	600	10750	20	3,8	17	120002
130	145 - 155	0,30	900	14700	20	4,0	20	130002
140	155 - 170	0,34	1030	15650	20	4,5	20	140002
155	170 - 185	0,37	1230	16650	20	5,1	22	155002
170	185 - 200	0,43	1320	16650	20	5,8	22	170002

* Clamping diameter adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element. • *** for clamping with pull-back action.
**** Clamping stroke H max. describes the load limit of the Clamping Element while activation without component.

Example for ordering

Please indicate the size of the Clamping Element and the clamping diameter of your component, including component tolerance, in your order:

Size:	KUD 80
Clamping diameter:	95,47 mm
Component tolerance:	H7

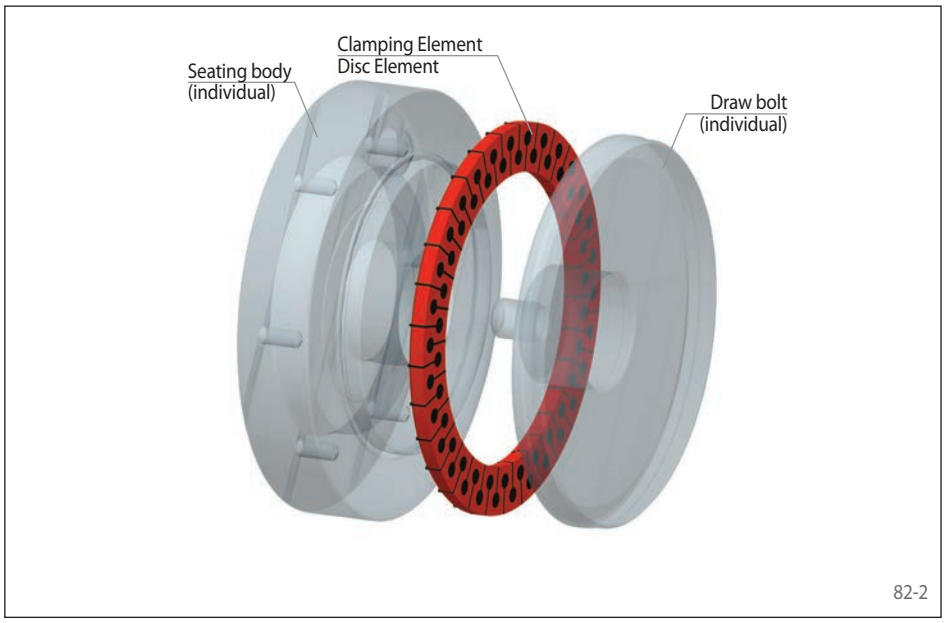
➡ KUD 80-95,47H7

Clamping Elements Disc Elements KBD

for customer assembled Disc Element Clamping Mandrels for setup to different clamping diameters within a given size

Features

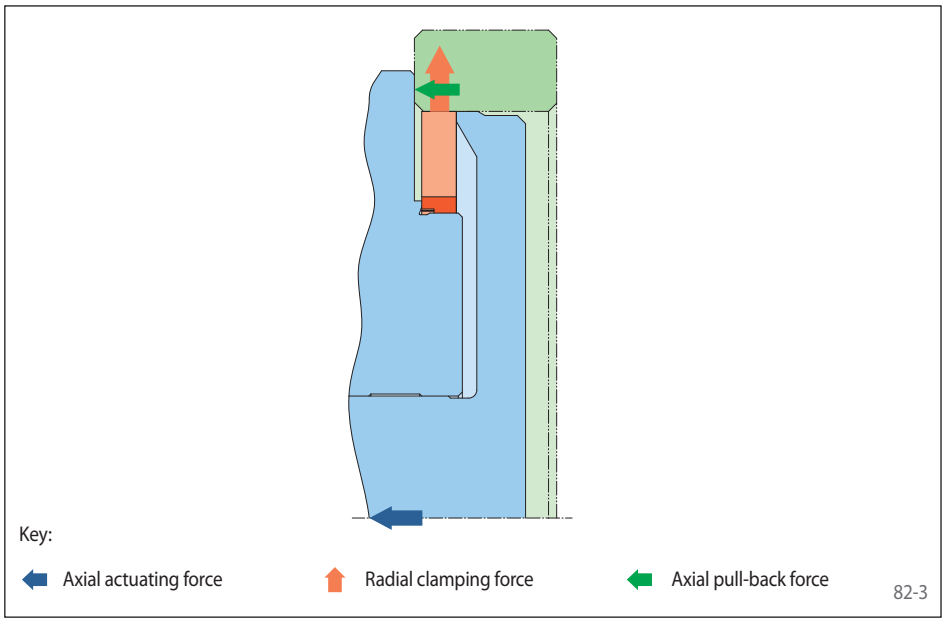
- For clamping diameters from 200 mm to 450 mm
- True running accuracy ≤ 0,02 mm
- Permissible component tolerance up to IT11
- Short clamping length
- Extended insertion depth
- Pull-back possible
- Hand clamping optional possible
- Rubberized slots in the Disc Element



Configuration

The Clamping Element Disc Element is an adaptation of the Clamping Element Bonded Disc Pack designed for large clamping diameters.

Disc Element Clamping Mandrels are produced individually according to customer specifications. To order these fixtures, please complete the questionnaire on page 119 and send it to us.

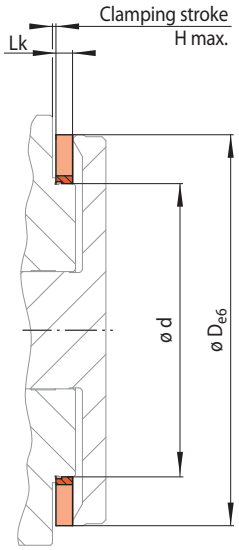


Clamping principle

The Disc Element sits pre-loaded on the seating diameter of the seating body. For clamping, the Disc Element is elastically deformed by an axial actuating force. The component is centred, pressed against the backstop and aligned flush.

Clamping Elements Disc Elements KBD

for customer assembled Disc Element Clamping Mandrels for setup to different clamping diameters within a given size



83-1

Size KBD … d mm	Achievable clamping diameter D* mm	Maximum diameter change** Δ D mm	Max. transmissible torque*** M Nm	Max. Actuating force with pull-back action Fm N	Max. Actuating force without pull-back action Fo N	H max. *** mm	Lk mm	Art.-No. 1195-
150	200 - 212	0,36	1400	53500	34500	1,8	8,5	150191
160	212 - 224	0,38	1600	57500	37000	1,9	8,5	160191
170	224 - 236	0,40	1850	62500	40500	2,0	8,5	170191
180	236 - 250	0,40	2050	64000	41000	2,1	10,0	180191
190	250 - 265	0,42	2300	68000	43500	2,2	10,0	190191
200	265 - 280	0,46	2600	72500	46000	2,4	10,0	200191
212	280 - 300	0,50	2800	75500	48500	2,6	10,0	212191
224	300 - 315	0,57	3400	85000	54500	2,8	12,5	224191
236	315 - 335	0,60	3700	88000	57000	3,0	12,5	236191
250	335 - 355	0,63	4200	93500	59500	3,2	12,5	250191
265	355 - 375	0,66	4800	99500	63500	3,4	12,5	265191
280	375 - 400	0,70	5200	103000	65500	3,7	16,0	280191
300	400 - 425	0,72	6100	111000	70000	3,9	16,0	300191
315	425 - 450	0,80	6800	117500	74000	4,3	16,0	315191

* Clamping diameter adjustable to two places after the decimal point • ** of the clamping diameter of the Clamping Element.
*** Clamping stroke H max. describes the load limit of the Clamping Element while activation without component.

Example for ordering

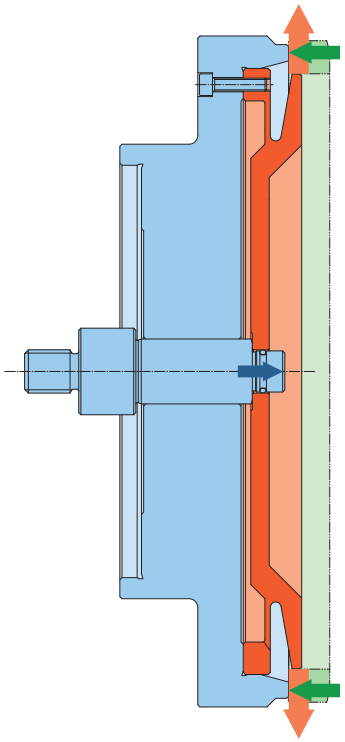
Please indicate the size of the Clamping Element and the clamping diameter of your component, including component tolerance, in your order:

Size:	KBD 160
Clamping diameter:	220,47 mm
Component tolerance:	H7

➡ KBD 160-220,47H7

Clamping principles for customized Clamping Mandrels

Segmented Diaphragm Clamping Mandrels



Segmented Diaphragm Clamping Mandrel

Key:

Axial actuating force | Radial clamping force | Axial pull-back force

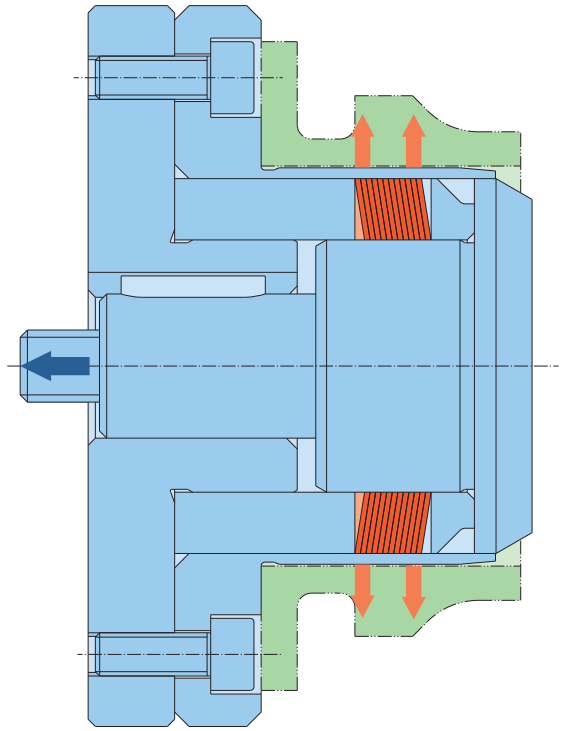
84-1

Features

- For clamping diameters from 160 mm to 1 600 mm
- True running accuracy ≤ 0,01 mm up to clamping diameter of 500 mm
- Very high repeating accuracy ≤ 0,005 mm
- Permissible component tolerance up to IT13
- Short clamping fixture length
- Extended insertion depth
- Pull-back possible
- For thin-walled or solid components
- Hand clamping optional possible
- Virtually wear-free due to elastic deformation during the clamping process. Thus guarantees very long service life
- Maximum possible rigidity of the entire machine-tool/clamping-fixture system due to the short clamping fixture length
- Suitable especially for turbine stage clamping

Clamping principles for customized Clamping Mandrels

Disc Actuated Bush Clamping Mandrels



Disc Actuated Bush Clamping Mandrel

Key:

Axial actuating force

Radial clamping force

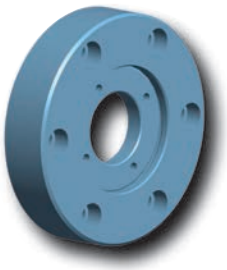
85-1

Features

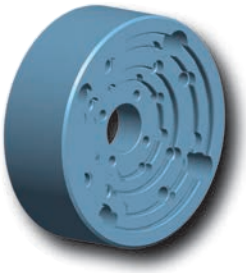
- For clamping diameters from 22 mm to 205 mm
- Very high true running accuracy ≤ 0,005 mm
- Maximum repeating accuracy ≤ 0,003 mm
- Permissible component tolerance up to IT9
- Short or long clamping length possible
- Extended insertion depth
- For thin-walled or solid components
- Hand clamping optional possible
- Virtually wear-free due to elastic deformation during the clamping process. Thus guarantees very long service life
- In contrast to Hydraulic Expanding Clamping Chucks, interruptions, e.g. keyways, are permissible in the component clamping diameter

Intermediate Flanges Z ...

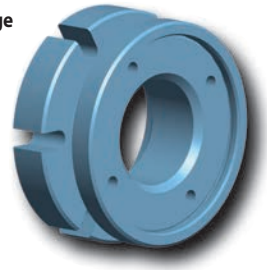
for machine connections in accordance to DIN 55026 Form A



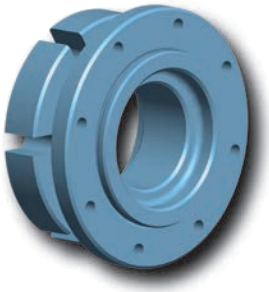
Intermediate Flange type A



Intermediate Flange type C



Intermediate Flange type B



Intermediate Flange type P

86-1

Description

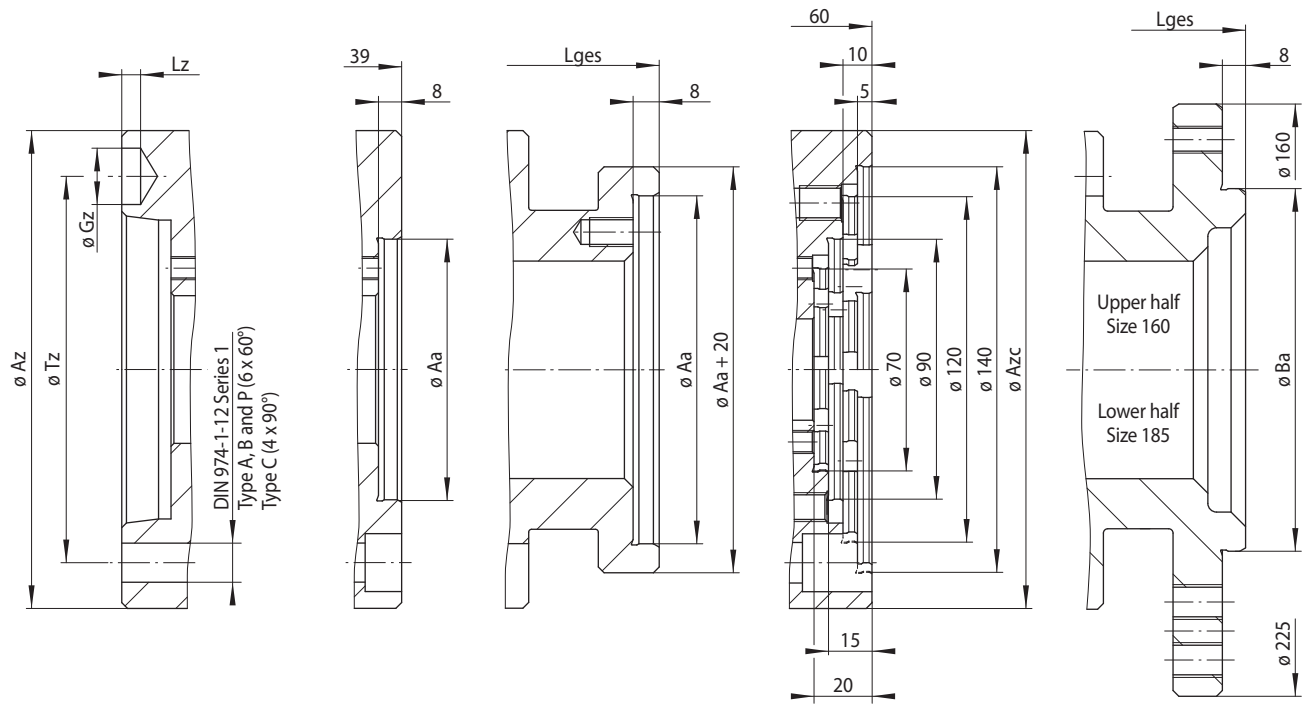
Intermediate Flanges are used as adapters between machine connection (DIN 55026, sizes A5, A6 or A8 - see the machine connection table) and the RINGSPANN Complete Clamping Fixtures.

Possible combinations are listed in the table below. Accordingly, a given Intermediate Flange can be used for different Complete Clamping Fixtures.

Centring	Intermediate Flange Z			for machine connections in accordance to DIN 55026			for Complete Clamping Fixtures							
							Bonded Disc Pack		Taper Collet		Taper Sleeve		Flat Element	
	Type	Size	for size Aa* mm	Size A5	Size A6	Size A8	Flange Chuck	Flange Mandrel	Flange Chuck	Flange Mandrel	Flange Chuck	Flange Mandrel	Flange Chuck	Flange Mandrel
at outside diameter Aa	A	70	70	✓	✓	✓		LBDF 11		BKDF 6 BKDF 7 BKDF 12 BKDF 18				
		90	90		✓	✓	LAFF 22 LAFF 32	LBDF 15 LBDF 20 LBDF 25	BKFF 35	BKDF 19 BKDF 27		HKDF 4 HKDF 6 HKDF 7 HKDF 12		
		120	120			✓	LAFF 42	LBDF 30 LBDF 35 LBDF 40 LBDF 45	BKFF 44 BKFF 56	BKDF 32		HKDF 19		
	B	90	90	✓			LAFF 22 LAFF 32	LBDF 15 LBDF 20 LBDF 25	BKFF 35	BKDF 19 BKDF 27		HKDF 4 HKDF 6 HKDF 7 HKDF 12		
		120	120	✓	✓		LAFF 42	LBDF 30 LBDF 35 LBDF 40 LBDF 45	BKFF 44 BKFF 56	BKDF 32		HKDF 19		
		140	140	✓	✓	✓	LAFF 52	LBDF 50		BKDF 43 BKDF 44 BKDF 54	HKFF 66 HKFF 76			
	C	70	70 90 120 140	✓	✓	✓	LAFF 22 LAFF 32 LAFF 42 LAFF 52	LBDF 11 LBDF 15 LBDF 20 LBDF 25 LBDF 30 LBDF 35 LBDF 40 LBDF 45 LBDF 50	BKFF 35 BKFF 44 BKFF 56	BKDF 6 BKDF 7 BKDF 12 BKDF 18 BKDF 19 BKDF 27 BKDF 32 BKDF 43 BKDF 44 BKDF 54	HKFF 66 HKFF 76	HKDF 4 HKDF 6 HKDF 7 HKDF 12 HKDF 19		
in bore diameter Ba	P	160	160	✓	✓	✓	LAFF 62	LBDF 60 LBDF 70	BKFF 79		HKFF 86 HKFF 96	HKDF 30 HKDF 40		
		185	185 200 225	✓	✓	✓	LAFF 80 LAFF 90 LAFF 100	LBDF 80 LBDF 90 LBDF 100	BKFF 110		HKFF 106 HKFF 114 HKFF 124 HKFF 134 HKFF 150	HKDF 60	KFFF 110 KFFF 120 KFFF 130 KFFF 140	KFDF 110 KFDF 120 KFDF 130

Intermediate Flanges Z …

for machine connections in accordance to DIN 55026 Form A



Machine connection sizes A5, A6 and A8 | **Intermediate Flange type A** | **Intermediate Flange type B** | **Intermediate Flange type C** | **Intermediate Flange type P**

87-1

Machine connections
in accordance to DIN 55026

Size	Az mm	Gz mm	Lz mm	Tz mm
A5	135	16,3	6,5	104,8
A6	165	19,45	6,5	133,4
A8	210	24,2	8,0	171,4

Intermediate Flange Z Type B
for centring at outside diameter Aa

Size Aa mm	A5 Lges mm	A6 Lges mm	A8 Lges mm
90	74		
120	74	75	
140	74	75	81

Intermediate Flange Z Type P
for centring in bore diameter Ba

Size Aa mm	Ba mm	A5 Lges mm	A6 Lges mm	A8 Lges mm
160	90	74	76	87
185 200 225	125	78	80	87

Intermediate Flange Z Type C
for centring at outside diameter Aa

Size Aa mm	A5 Azc mm	A6 Azc mm	A8 Azc mm
70	160	165	210

Mounting

We recommend using bolts with strength class 10.9 to mount the Clamping Fixture to the Intermediate Flange and the Intermediate Flange to machine connection.

Example for ordering types A, B and C

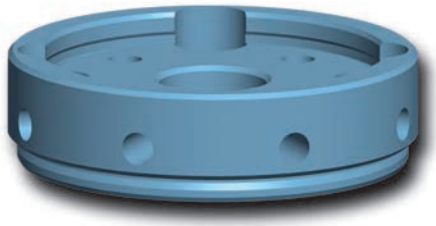
Intermediate Flange Z, type C for centring at outside diameter Aa, for machine connections in accordance to DIN 55026 size A8, for size Aa of 120 mm:

- ZCA8 70

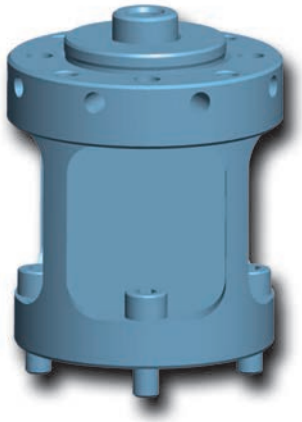
Example for ordering type P

Intermediate Flange Z, type P for centring in bore diameter Ba, for machine connections in accordance to DIN 55026 size A6, for size Aa of 185 mm:

- ZPA6 185



Intermediate Flange Z
Type D



Spring Force Actuator
FUSR

88-1

Increasingly demanding requirements for balancing accuracy make precise balancing procedures an absolute must.

RINGSPANN Intermediate Flanges for manual clamping and Spring Force Actuators for automated serial production conform to these high standards.

As adapters, they connect the RINGSPANN Precision Clamping Fixture with the balancing machine spindle. The spindle connection conforms to the standard set for Schenk RoTec balancing machines.

Source: Schenck RoTec vertical balancing machine in a production line

88-2

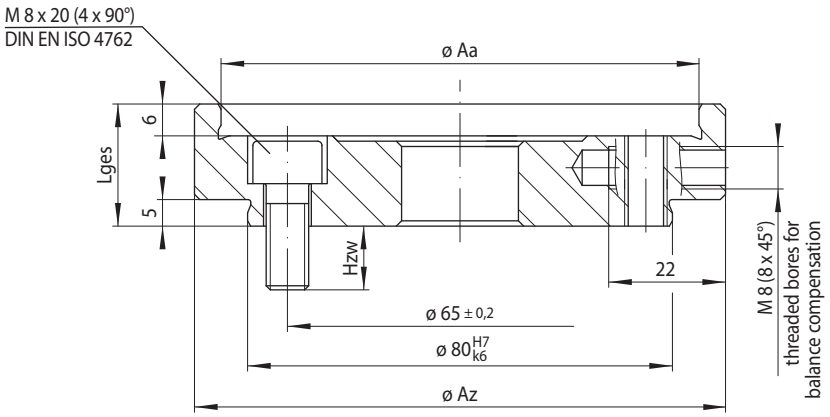
Application example

This example shows the components in use on a Schenk RoTec balancing machine. During the balancing operation, the component remains clamped in place by spring force. To release and change components, the machine-side plunger counteracts the spring force in the idle mode and releases the clamping system.

1. Spring Force Actuator FUSR
2. Taper Collet Flange Mandrel
3. Optional backstop ring

Intermediate Flanges Z Type D

for manual clamping
for machine connections of balancing machines



89-1

	Intermediate Flange Z		for Complete Clamping Fixtures			Az	Hzw	Lges
	Type	Size Aa	Taper Sleeve Flange Chuck	Bonded Disc Pack Flange Mandrel	Taper Collet Flange Mandrel	mm	mm	mm
for centring at outside diameter Aa	D	70		LBDF 11	BKDF 6 BKDF 7 BKDF 12 BKDF 18	84	12	23
		90		LBDF 15 LBDF 20 LBDF 25	BKDF 19 BKDF 27	100	12	23
		120		LBDF 30 LBDF 35 LBDF 40 LBDF 45	BKDF 32	130	10	29
		140	HKFF 66 HKFF 76	LBDF 50	BKDF 43 BKDF 44 BKDF 54	150	10	31

Description

Intermediate Flanges Z, Type D connect RINGSPANN Precision Clamping Fixtures to the spindles of balancing machines as adapters.

The component is clamped and released by activating the Precision Clamping Fixture manually. The Intermediate Flange is available in four sizes and is capable of large clamping ranges when supplemented by different Precision Clamping Fixtures.

Eight radial threaded bores are provided for the purpose of balancing the Intermediate Flange with Precision Clamping Fixture. The Intermediate Flange is mounted to the machine with four M 8 bolts.

Example for ordering type D

Intermediate Flange Z, type D for balancing machines (SR), with dimension Aa of 90 mm, for centering Taper Sleeve Flange Mandrel BKDF 27 on outside diameter Aa:

- ZDSR 90-BKDF 27

Spring Force Actuator FUSR

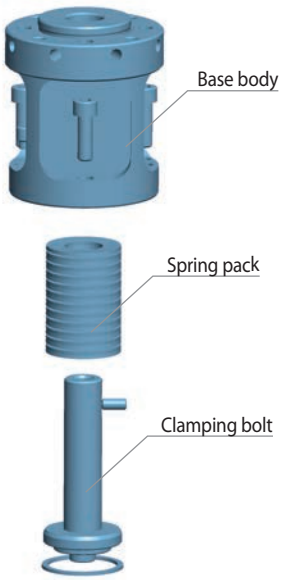
for spring-powered clamping for balancing machines

Description

Spring Force Actuators FUSR connect RINGSPANN Precision Clamping Fixtures to the spindles of balancing machines as adapters.

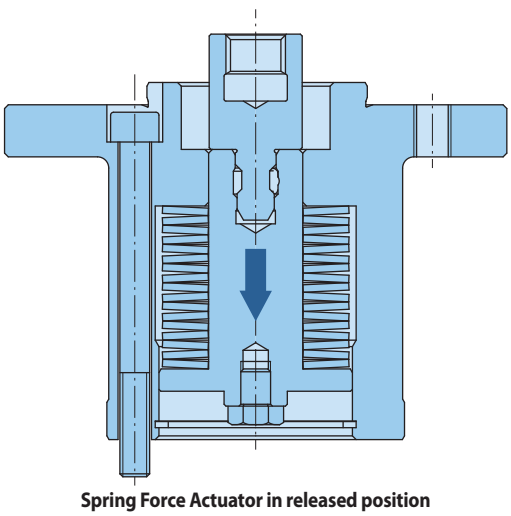
The component is clamped by activating the Precision Clamping Fixture with the aid of the intrinsic spring force of the Spring Force Actuator. Release is effected via the machine-side plunger, which counteracts the spring force. The Spring Force Actuator is available in five dimensions and is capable of large clamping ranges when supplemented by different Precision Clamping Fixtures.

Eight radial threaded bores are provided for the purpose of balancing the Spring Force Actuator with Precision Clamping Fixtures. The unit is mounted on the machine with four M 8 bolts.



Configuration

The Spring Force Actuator for balancing machines comprises a base body, a spring pack and a clamping bolt. Installation is effected via the flange connection of the Spring Force Actuator specifically designed for balancing machines. The Clamping Fixture is activated by spring force and released by the machine-side power clamping device, which counteracts the spring force of the Spring Force Actuator via the machine-side plunger.

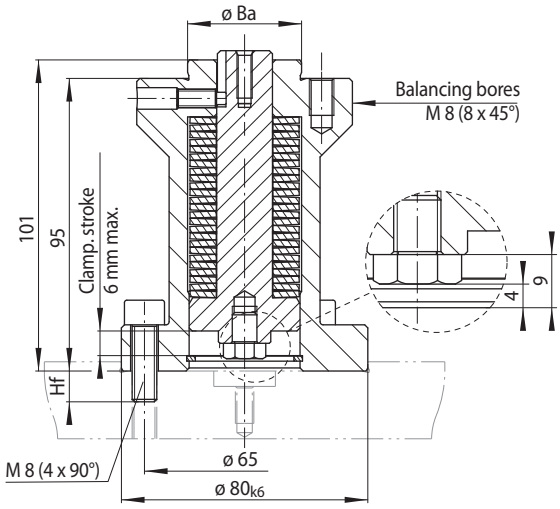


Clamping principle

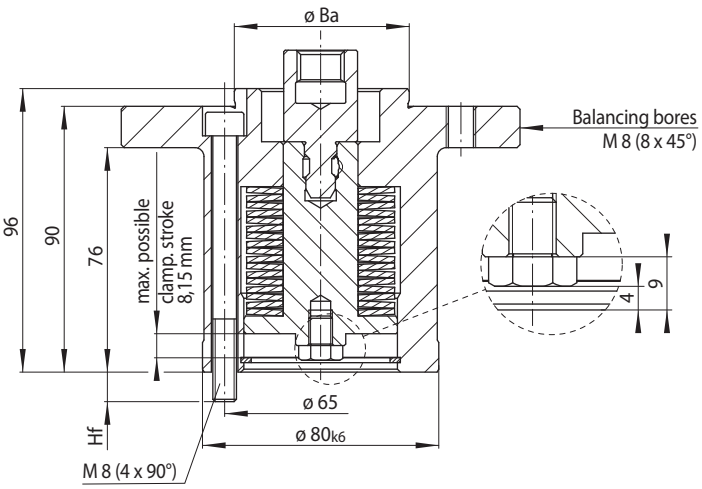
When the machine-side axial releasing force is removed, the spring force is exerted on the clamping bolt. This moves in the axial direction and activates the clamping element of the Clamping Fixtures, which is connected to the clamping bolt.

Spring Force Actuator FUSR

for spring-powered clamping for balancing machines



Spring Force Actuator size 70 91-1



Spring Force Actuator size 90 to 225 91-2

Spring Force Actuator FUSR for centring in bore diameter Ba						for Complete Clamping Fixtures			
				Effective clamping force F**		Taper Collet***		Taper Sleeve	
Size	for size Aa* mm	Ba $_{-0,02}$ mm	Hf mm	Clamp. stroke 0 mm min. N	Clamp. stroke 6 mm max. N	Flange Chuck	Flange Mandrel	Flange Chuck	Flange Mandrel
70	70	37	10	1800	3840		BKDF 6 BKDF 7 BKDF 12 BKDF 18		
90	90	50	10	2300	3840	BKFF 35	BKDF 19 BKDF 27		HKDF 4 HKDF 6 HKDF 7 HKDF 12
120	120 140	60	10	2300	3840	BKFF 44 BKFF 56	BKDF 32 BKDF 43 BKDF 44 BKDF 54	HKFF 66 HKFF 76	HKDF 19
160	160	90	12	2300	3840	BKFF 79		HKFF 86 HKFF 96	HKDF 30 HKDF 40
185	185 200 225	125	12	2300	3840	BKFF 110		HKFF 106 HKFF 114 HKFF 124 HKFF 134 HKFF 150	HKDF 60

* Corresponds to diameter Aa of the Precision Clamping Fixture.
** The effective clamping force and thus the transmissible torque depend on the tolerance of the clamping diameter.
*** When a Spring Force Actuator is in use, the maximum clamping stroke is 6 mm, i.e. maximum diameter change D for Taper Sleeve Flange Chucks BKFF 79 to BKFF 110 and Taper Sleeve Flange Mandrels BKDF 32 to BKDF 54 is 1,2 mm.

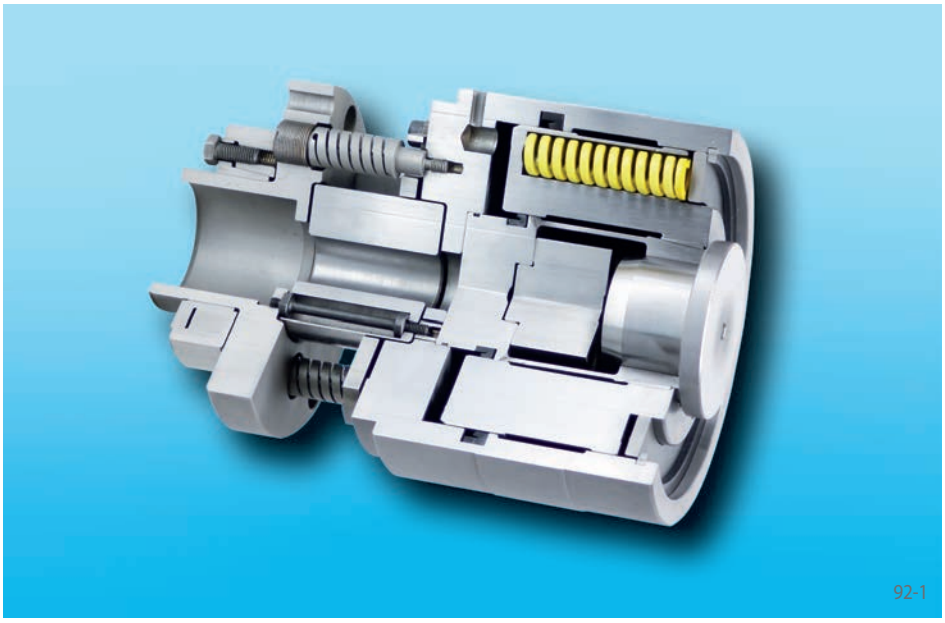
Example for ordering

Spring Force Actuator FUSR for balancing machines, size 140, for centering a Taper Sleeve Flange Mandrel BKDF 44 in bore diameter Ba:

- FUSR 140-BKDF 44

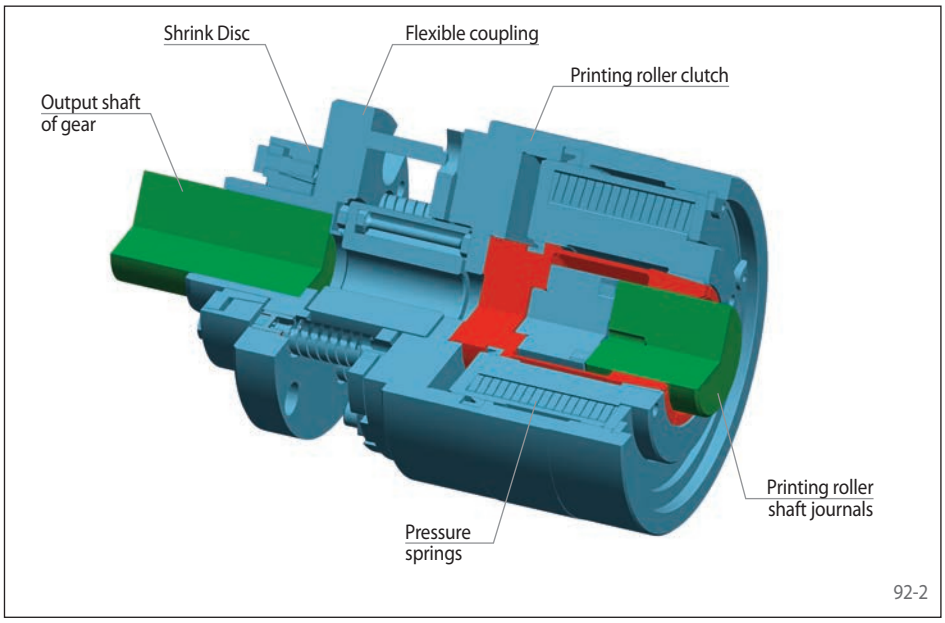
Clamping Clutches SKDZ

for printing rollers in printing presses spring activated - pneumatically released



Features

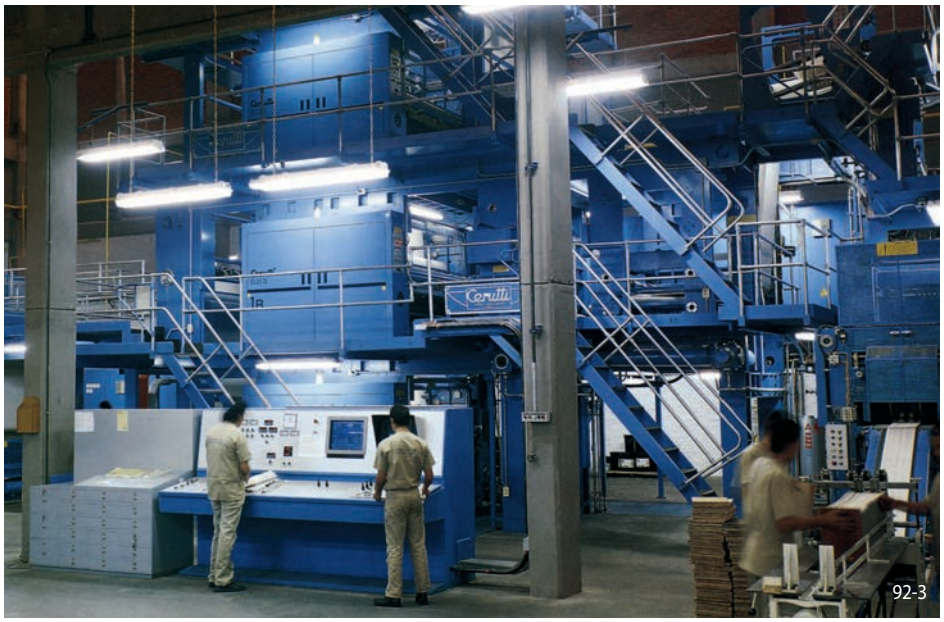
- For clamping diameters from 40 mm to 70 mm
- High true running accuracy
- High torsional rigidity
- High axial rigidity
- Extended insertion depth
- Compensation up to 0,5 mm for radial misalignment
- Compensation for angular misalignment



Configuration

The Clamping Clutch for printing rollers in printing presses consists of the printing roller clutch, a flexible coupling connected by a Shrink Disc to the output shaft of gear. The flexible coupling compensates for axial and angular misalignment vis-à-vis the position of the printing roller while maintaining the torsional and axial rigidity required to ensure acceptable printing quality.

The printing roller clutch is released by pneumatic pressure. When it is released, the printing roller is engaged. When pneumatic pressure is removed, the printing roller clutch closes and clamps the printing roller shaft journal without pull-back action. The printing roller clutch is aligned with the axis of the fixed printing roller.

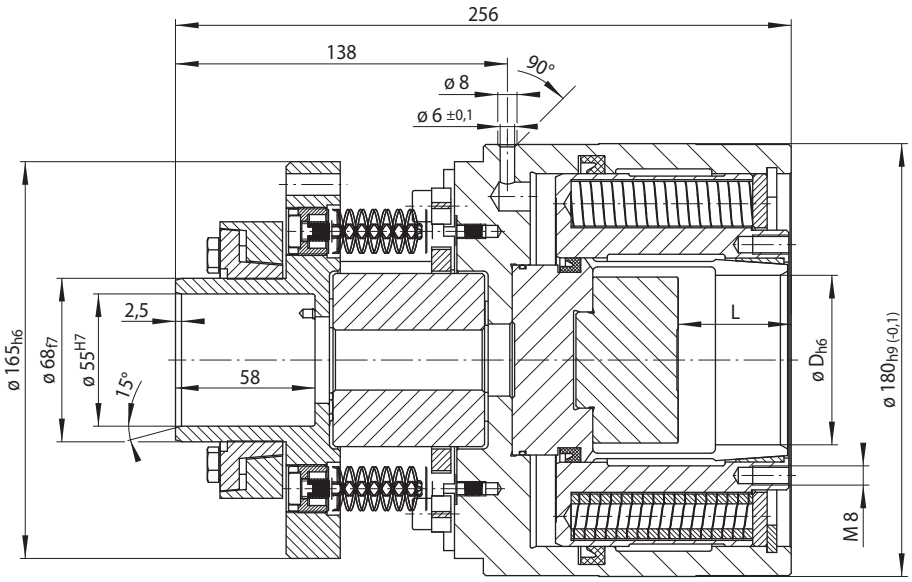


Advantages

- For rapid changes and precise clamping of printing rollers in printing presses in gravure and flexographic printing
- Reduces setup costs and facilitates flexible production with short cycle times
- Reliable slip-free drive power transmission
- Balanced, thus smoother running at high speeds

Clamping Clutches SKDZ

for printing rollers in printing presses
spring activated - pneumatically released



93-1

Type	Clamping range D		Δ D	Insertion depth L		Transmissible torque	Transmissible axial force	Necessary release pressure
	min. mm	max. mm	mm	min. mm	max. mm	Nm	N	bar
SKDZ 10	40	55	0,7	40	55	280	± 4000	15
SKDZ 20	> 55	70	0,7	40	55	280	± 8000	17

Example for ordering

Please indicate the size of your Clamping Clutch, the clamping diameter of your printing roller, including tolerance, and the insertion depth L in your order:

Size:	SKDZ 10
Clamping diameter:	50 mm
Tolerance:	h6
Insertion depth:	45 mm

➡ SKDZ 10-50h6-45

Maximum speed in rpm

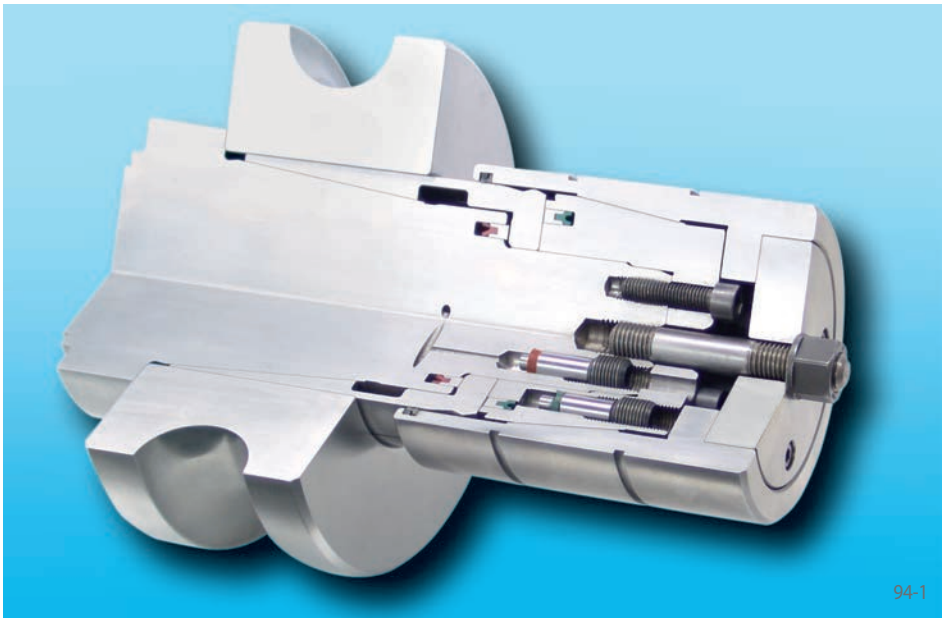
Clamping Clutches may be used up to a max. speed of 1000 min^{-1}.

Hydraulically released

Other Clamping Clutches, e.g. with hydraulically released, are available upon request.

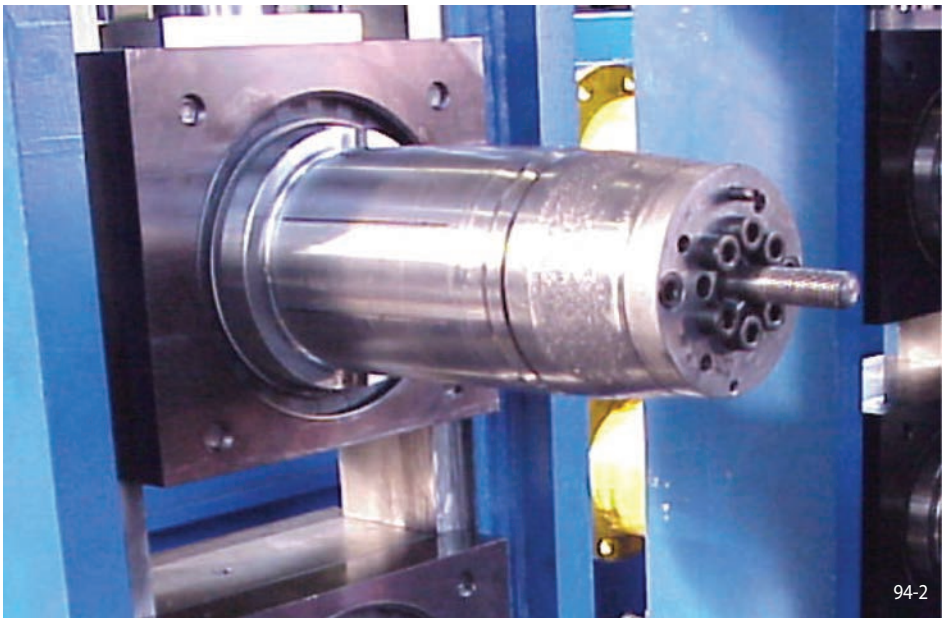
Clamping Clutches SKPW

for profile rollers in tube rolling mills



Features

- For rapid changes and precise clamping of profile rollers
- Minimized bearing internal clearance for maximum precision
- High true running accuracy ≤ 0,01 mm
- Simple operation
- Very quick setup to other profile rollers
- Maximum rolling profile accuracy
- Prevention of fretting corrosion through press fits and surface coatings
- Very high radial roller shaft rigidity
- Extended maintenance intervals due to the robust and completely self-enclosed system

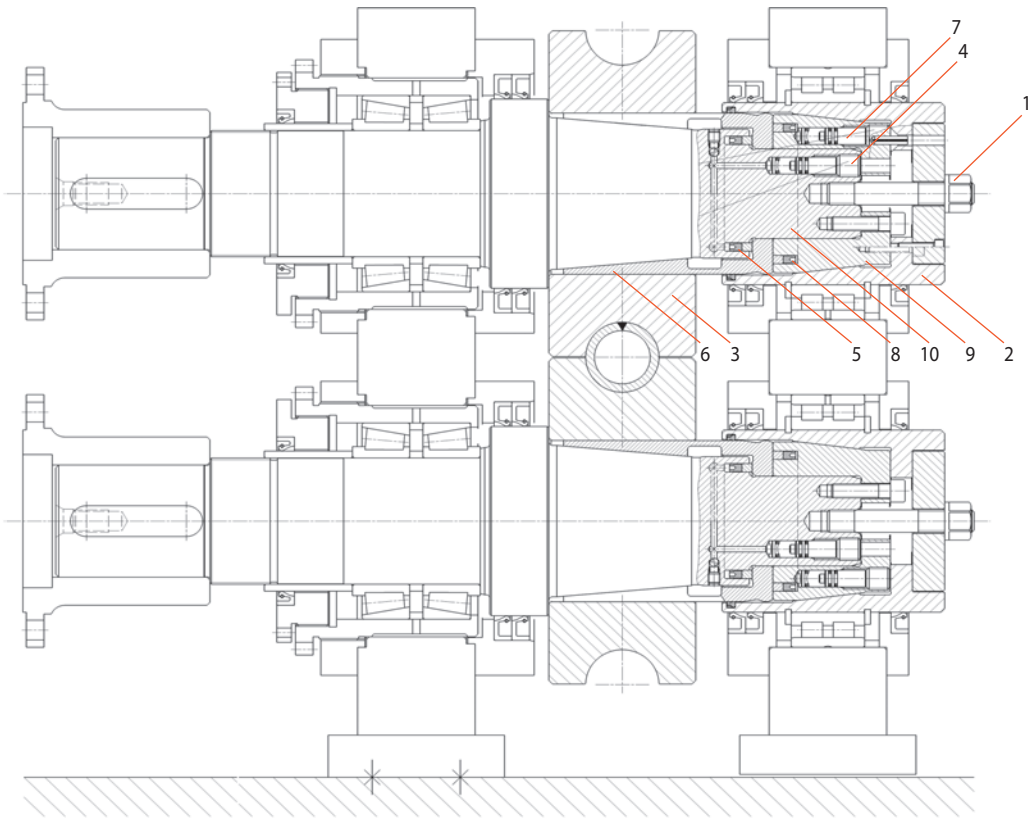


Areas of application

Applications for Clamping Clutches for profile rollers are profile rolling lines, pipe welding systems, calibrating lines and all systems in which rotating tools must be changed rapidly to reduce setup times.

Clamping Clutches SKPW

for profile rollers in tube rolling mills



1 Central nut
2 Bearing bush
3 Profile roller
4 Actuating screw for releasing
5 Ring piston for releasing
6 Clamping Element Taper Collet
7 Actuating screw for clamping
8 Ring piston for clamping
9 Intermediate bush
10 Journals on the base body of the Clamping Clutch

95-1

Configuration

The roller mount is a hydraulically actuated, play-free taper press connection between the shaft and the roller. The risk of fretting corrosion is eliminated.

The reduction of bearing play on the side of the adjustable roller stand is achieved by a second taper press connection between the shaft and the bearing bush.

The Clamping Clutch for profile rollers is designed for the transmission of high torques and for high radial and axial forces applied to the clamping system.

Clamping Clutches for profile rollers are available in other versions, e.g. equipped with RINGSPANN Bonded Disc Packs in parallel clamping configuration.

Clamping Clutches for profile rollers are designed by RINGSPANN for specific applications. We will be glad to advise you.

Clamping principle

The central nut (1) (Fig. 83-1) is removed first. This releases the taper connection in the bearing bush (2). The front adjustable roller stand A is moved with the entire bearing unit far enough to the right so that the profile roller (3) can be replaced easily.

The actuating bolt for clamping (7) is then loosened and the actuating bolt for release (4) is tightened. The adjacent hydraulic piston builds up pressure. This pressure moves the ring piston (5) and the Taper Collet (6) to the right. The clamping connection is released. The profile roller (3) can now be removed. This situation is illustrated without a roller in Fig. 82-2.

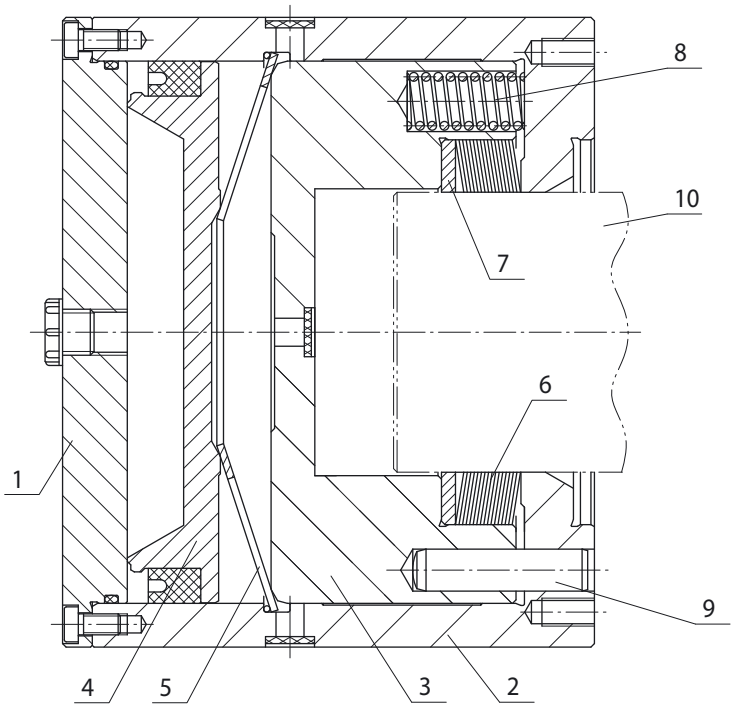
The new profile roller is clamped by loosening actuating bolt (4) and tightening actuating bolt (7). The pressure exerted by the adjacent hydraulic piston actuates the left ring piston (8) and the Taper Collet (6) clamps the profile roller (3) to the shaft (11).

The front roller stand A is then pushed back toward the left until the tapered bore of the bearing bush (2) sits on the tapered mantle surface of the intermediate bush (9). The intermediate bush (9) is shrunk fit to the pin on the base body of the Clamping Clutch (10) and bolted axially.

Then the nut (1) is replaced and tightened until the inner right face of the bearing bush (2) lies flush against the left face of the intermediate bush (9). Due to the prescribed overdimension in the taper, the outer bearing bush (2) has now expanded to the extent that the minimum play in the roller bearing is achieved with maximum reproducible precision.

Application examples

Screw testing rig



1	Cover	6	Bonded Disc Pack
2	Cylinder tube	7	Thrust ring
3	Seating body	8	Pressure springs
4	Pneumatic piston	9	Positioning pins
5	Lever spring	10	Component

96-2

Component

Tool for actuating torque testing of screws

Type of machine

Testing machine

Machining

Material testing of screws

Task

Clamping of a torque transmission shaft

Our solution

- Bonded Disc Pack Flange Chuck
- Pneumatically activated

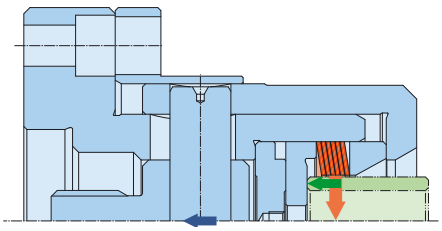
Customer benefit

- Small cross-section
- Very high transmissible torque with low actuating air pressure
- Additional clearance
- Easy to maintain

Brief description

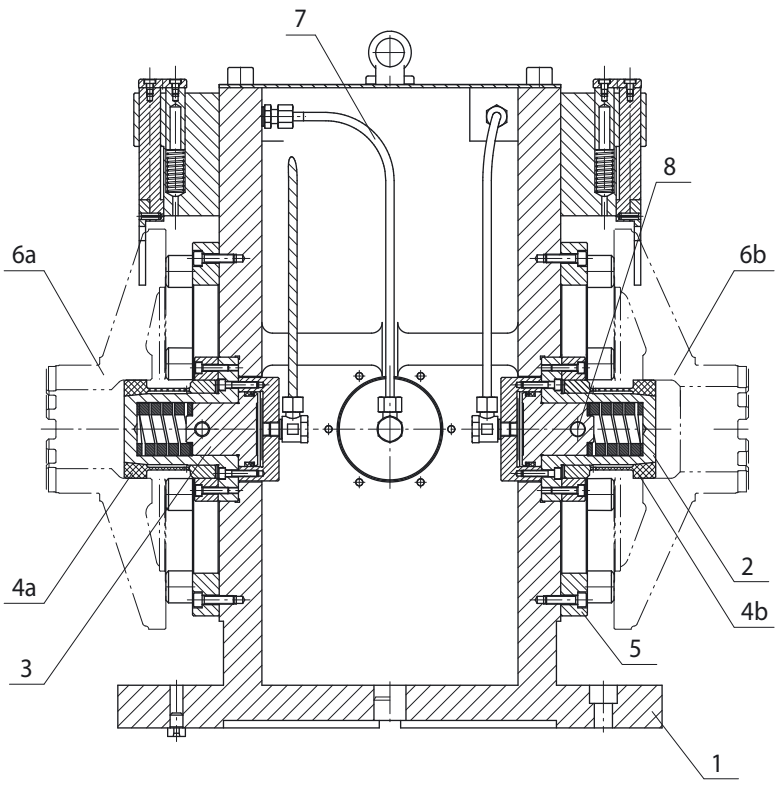
The pneumatic piston (4) acts upon a special spring lever (5) that engages the seating body (3) with a specified gear ratio. The Bonded Disc Pack (6) is located inside the seating body (3). The axial force generated in this was raises the Bonded Disc Pack (6) to an upright position, centring and clamping the shaft. The chuck is opened by the pressure springs (8) when pneumatic pressure is removed. The torque generated during the test is transmitted via several precisely fitted positioning pins (9).

Clamping principle



Application examples

Truck differential case



1 Clamping cube
2 Seating body / Base body
3 Piston
4a Taper Sleeve 1
4b Taper Sleeve 2
5 Backstop ring
6a Component 1
6b Component 2
7 Hydraulic system
8 Cross bolt

97-2

Component

Truck differential case

Type of machine

Machining centre

Machining

Drilling

Task

- Clamping of truck differential housing
- Option of changing the clamping diameter
- Automatic loading

Our solution

- Taper Sleeve Flange Mandrel
- Change of clamping diameter by using a different Taper Sleeve
- Complemented by a clamping device and machine bed coupling adapter
- Hydraulically activated

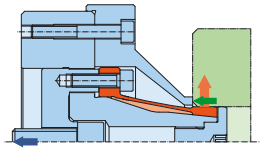
Customer benefit

- Quick assembly
- Additional clearance
- Impervious to ingress of foreign objects due to the rubberized slots in the Taper Sleeve

Brief description

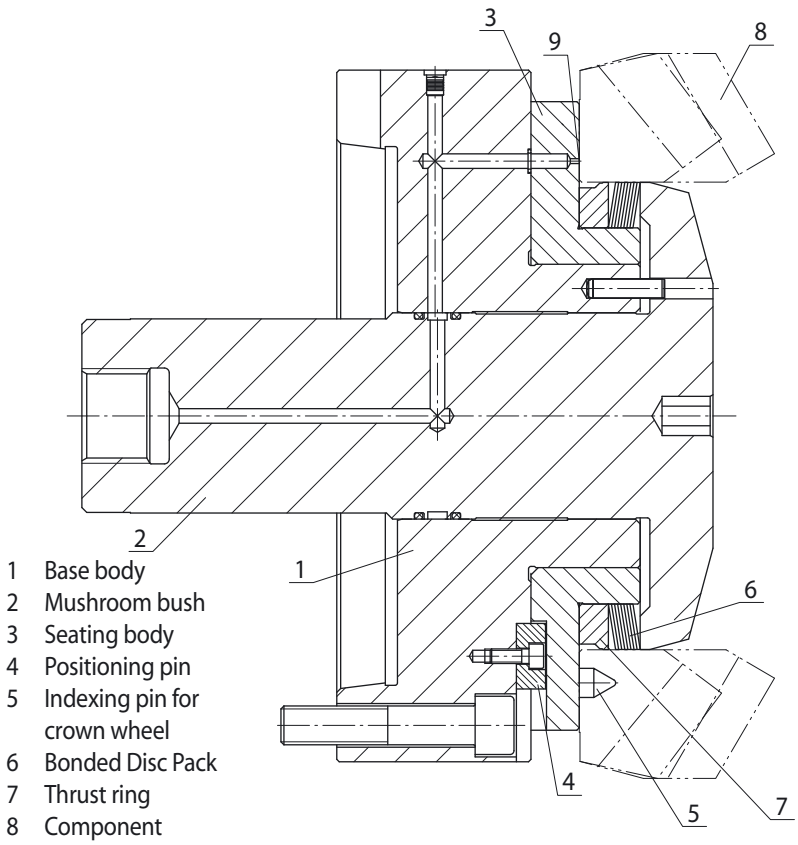
Different truck differential cases can be clamped with various backstop rings (5) and Taper Collets (4). Conversion can be effected in a short period of time. Clamping and release are actuated by hydraulic pressure. During clamping, the pressure draws the Taper Collet (4) against the tapered base body (2). The component (6) is drawn against the backstop ring (5), aligned, centred and clamped. Radial and axial runout are less than 0,01 mm. This solution is used to clamp on very small clamping surfaces, and to adjust insertion play through the stroke. This clamping system is ideal for automatic loading. The clamping cube (1) is equipped with a zero-point clamping system that matches the machine table. This provides for rapid and precisely positioned clamping.

Clamping principle



Application examples

Truck crown wheel



1 Base body
2 Mushroom bush
3 Seating body
4 Positioning pin
5 Indexing pin for crown wheel
6 Bonded Disc Pack
7 Thrust ring
8 Component
9 Backstop control by air pressure

98-2

Component

Truck crown wheel

Type of machine

Tooth milling machine

Machining

Tooth milling

Task

- Clamping of blank crown gear in the central bore hole
- Automatic loading
- 3 shift serial production
- Quick change to a different clamping diameter

Our solution

- Bonded Disc Pack Flange Mandrel with interchangeable clamping sets and backstop control
- Power activated

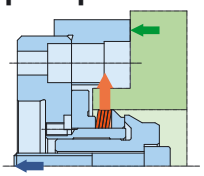
Customer benefit

- High clamping precision
- Easy loading due to special loading chamfer on mushroom bush and additional clearance
- Backstop control by air pressure
- Long service life of Bonded Disc Pack
- Interchangeable clamping sets for short set-up time

Brief description

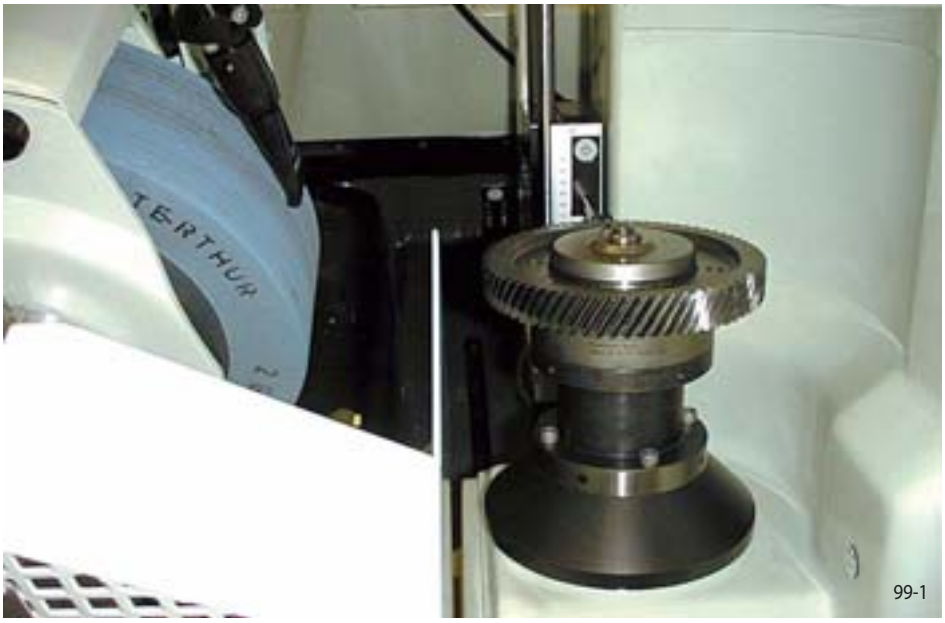
The Bonded Disc Pack Flange Mandrel is equipped with an automatic component feed unit. In order to ensure collision-free loading, the mushroom bush (2) is designed with an insertion chamfer. The additional clearance of approx. 0,2 mm further facilitates loading. During the clamping process, the crown wheel (8) is aligned, pressed against the contact surface and clamped. Radial and axial runout amount to 0,01 mm. Exact flush alignment is monitored by an air-system control unit (9). By changing the replaceable clamping sets consisting of a mushroom bush (2), a seating body (3), a thrust ring (7) and a Bonded Disc Pack (6), the clamping system can be reconfigured quickly for processing of other crown wheel types.

Clamping principle

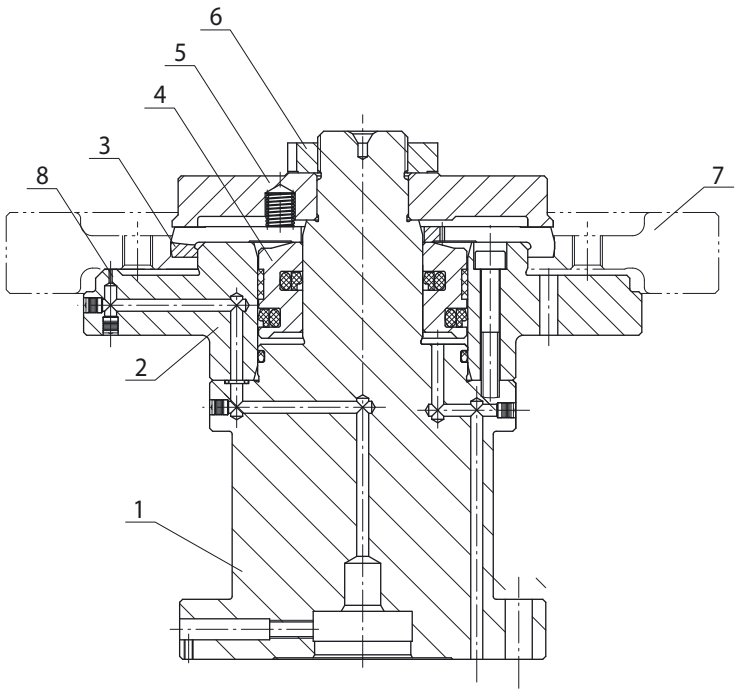


Application examples

Car spur gear



99-1



1 Base body / Seating body
2 Backstop with air pressure control
3 Flat Element Flange Mandrel
4 Piston
5 Cover with pressure springs
6 Grooved nut
7 Component
8 Backstop control by air pressure

99-2

Component
Car spur gear

Type of machine
Grinding machine

Machining
Helical gear grinding

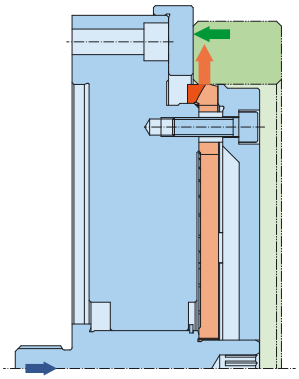
Task
- Precise centring of spur gear
- Backstop control

Our solution
- Flat Element Flange Mandrel
- Backstop control by air pressure
- Release by intrinsice clamping element spring force
- Hydraulically activated

Customer benefit
- High true running accuracy ≤ 0,01 mm
- Maximum repetition accuracy ≤ 0,004 mm
- Suitable for automatic loading
- Reliable component backstopping
- Ideally suited for serial production

Brief description
When hydraulic pressure is applied, the piston (4) is pressed against the Clamping Element (3) of the Flat Element Flange Mandrel and engages it. The spur gear (7) is centred, pressed by pull-back action against the contact surface (2) and clamped. The correct position of the spur gear is checked and ensured by pneumatic pressure (8). The clamping system is additionally centred and stabilized with a sleeve. When hydraulic pressure is removed, the system is relaxed. Multiple pressure springs in the cover (5) help to push the piston (4) back against the frictional force of the piston rings.

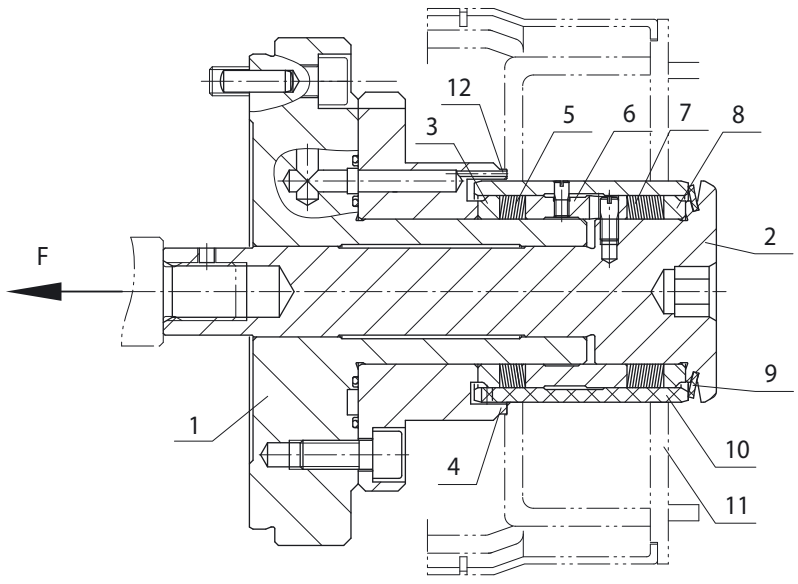
Clamping principle



Application examples

Planetary carrier

100-1



1 Base body / Seating body
2 Mushroom bush
3 Thrust ring
4 Backstop ring
5 Narrow Bonded Disc Pack
6 Differential bush
7 Wide Bonded Disc Pack
8 Thrust ring
9 Pressing spring
10 Collet
11 Component
12 Backstop control by air pressure

100-2

Component

Planetary carrier

Type of machine

Special drilling machine

Machining

Drilling and reaming

Task

- Clamping at two different clamping positions
- Backstop control by air pressure
- Power clamping
- Indirect clamping without pull-back action

Our solution

- Indirect Differential Bonded Disc Pack Flange Mandrel with collet
- Power activated

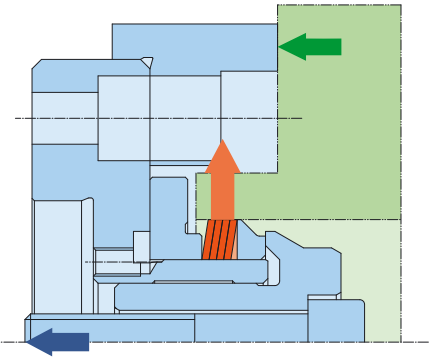
Customer benefit

- Clamping at two different clamping positions with one central actuator
- High true running accuracy ≤ 0,01 mm
- Minimum distortion of thin walled component during clamping

Brief description

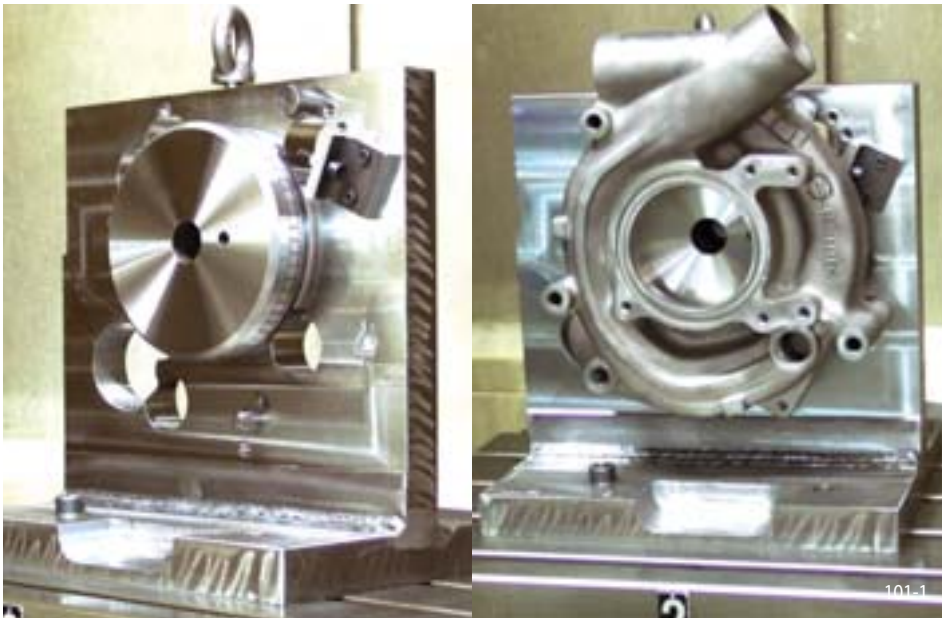
The two Bonded Disc Packs (5, 7) are actuated independently by a central power actuating unit. The narrow Bonded Disc Pack (5) is raised first due to its low intrinsic spring power. It clamps the planetary carrier (11) and presses it against the backstop (4). Then the second Bonded Disc Pack is raised (7) and exerts a centring force on the planetary carrier (11). The correct flush alignment of the planetary carrier is monitored by an air-system control unit (12).

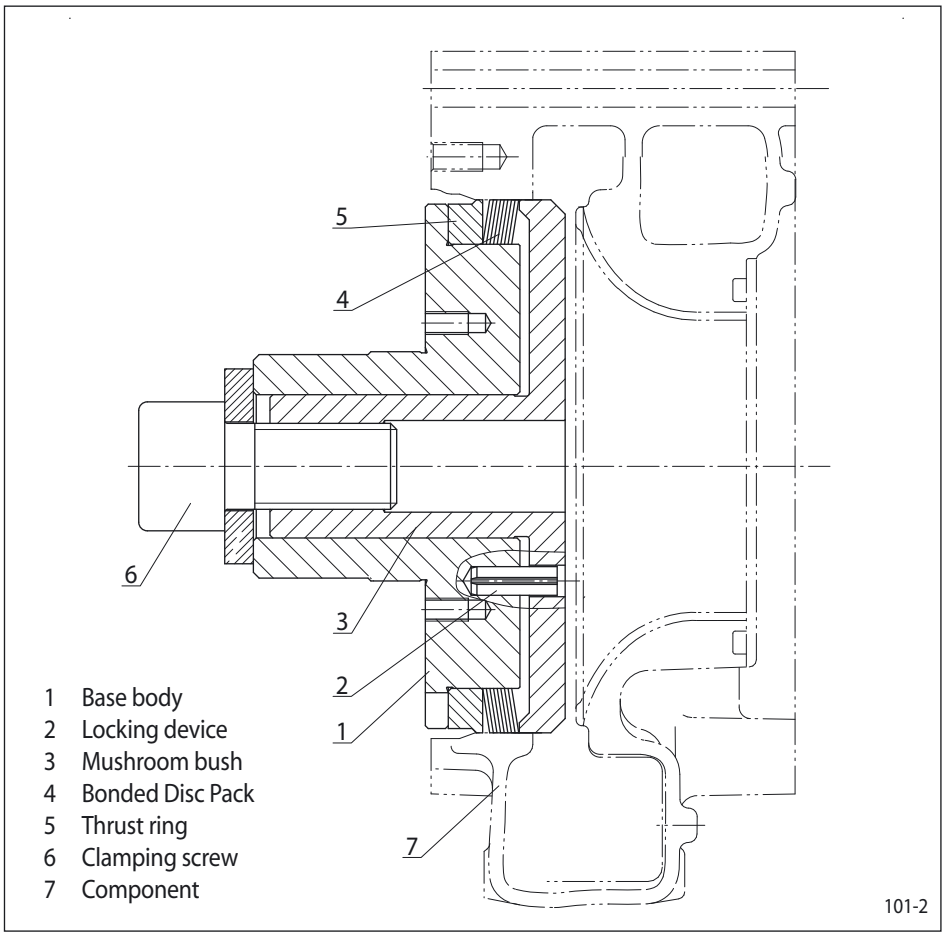
Clamping principle



Application examples

Turbocharger housing





Component
Turbocharger housing

Type of machine
Machining centre

Machining
Drilling and milling

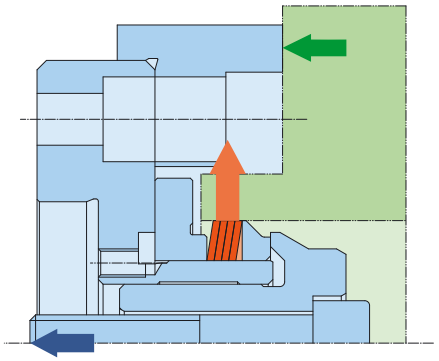
Task
- Centering, alignment and clamping for precise hole pattern reproduction
- All machining steps in one clamping operation
- Precise angular component position

Our solution
- Bonded Disc Pack Flange Mandrel
- Clamping by central actuating screw; without manual clamp
- Manually activated

Customer benefit
- Short set-up time
- High accuracy
- For flexible use on different machines
- Short
- Long service life
- Additional clearance

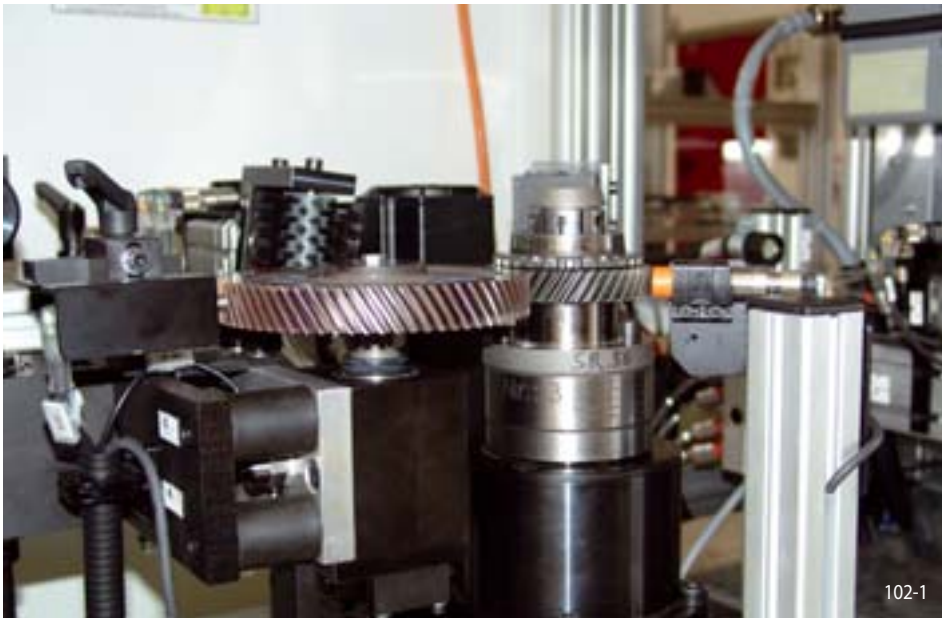
Brief description
The component (7) is pressed by hand against the flat surface and then turned toward the backstop to secure the angular position. Then the clamping bolt (6) is manipulated with a torque spanner. The component is securely seated and can now be processed. To release, the clamping bolt (6) is loosened and the component can be removed.

Clamping principle



Application examples

Gear wheel



Component

Gear wheel

Type of machine

Testing machine

Machining

Inspection of gear tooth performance

Task

- Clamping of gear wheels during automatic operation
- Transmission of torque during testing
- High true running accuracy

Our solution

- Taper Collet Flange Mandrel
- Power activated

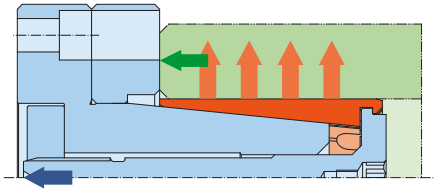
Customer benefit

- Additional clearance (1,2 mm expansion)
- True running accuracy ≤ 0,01 mm

Brief description

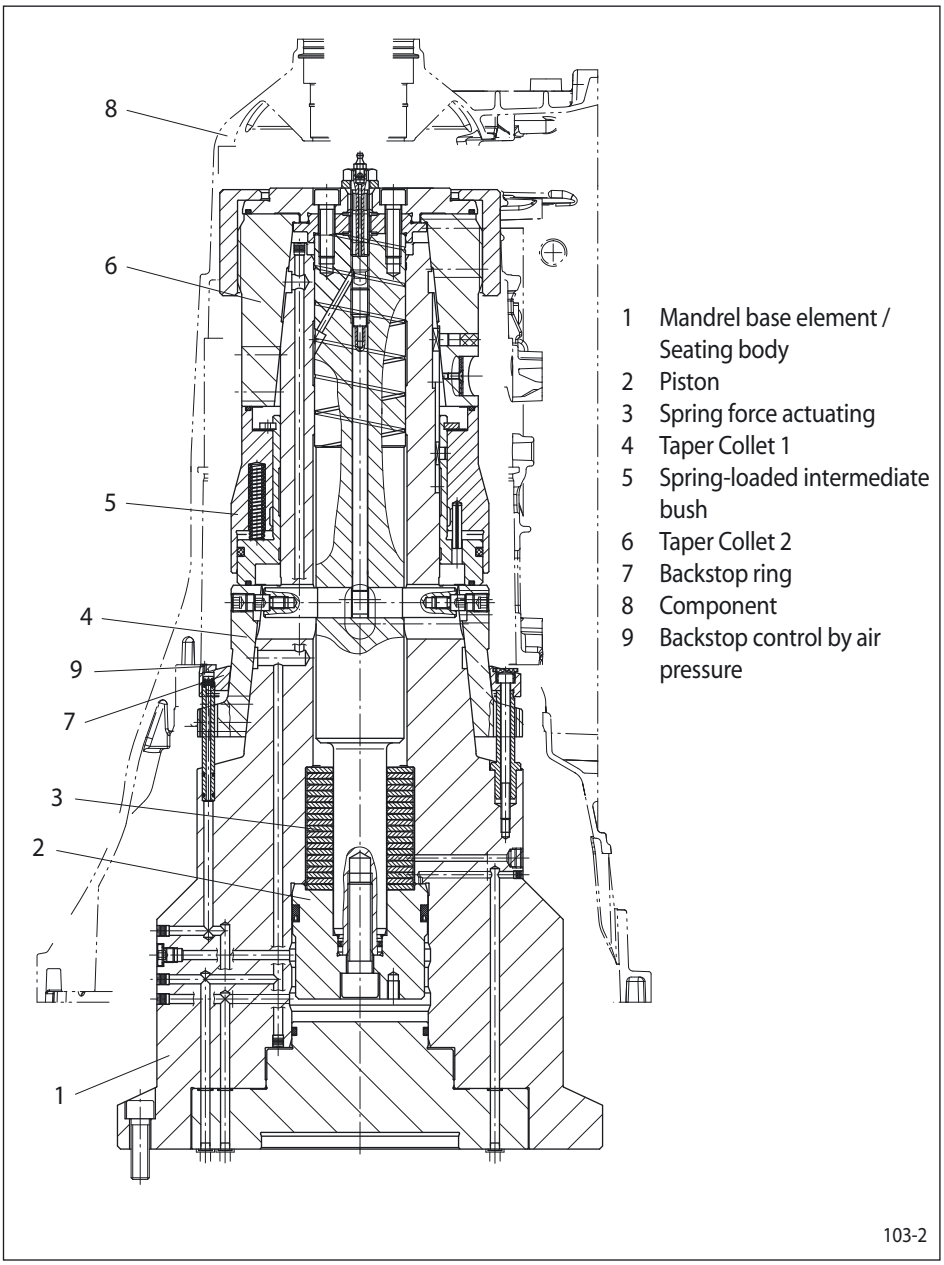
The Taper Collet Flange Mandrel is integrated within a fully automated testing machine. Loading and unloading are effected by a robot. The entire gear wheel is pressed against the master wheel, which drives it. The resulting noise is measured and evaluated. At the same time, geometric scanning and inspection are performed by a laser.

Clamping principle



Application examples

Die-cast aluminium housing for automatic transmissions in cars



Component

Die-cast aluminium housing for automatic transmissions in cars

Type of machine

Machining centre

Machining

Drilling and milling

Task

Housing alignment, centring and clamping

Our solution

- Differential Taper Collet Flange Mandrel
- Spring activated

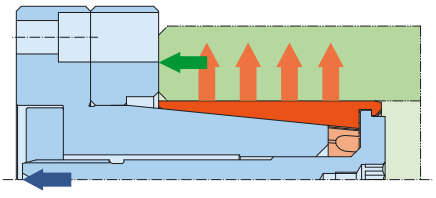
Customer benefit

- Precise clamping and centering of long components
- Easy actuating; hydraulic pressure required for release only
- Pneumatic pressure is used to verify the correct position of the component
- The entire system is rigid and permits no vibration during machining
- Easy loading and off-loading due to added insertion clearance
- Long service life (first maintainance after 5 years of 3-shift production)

Brief description

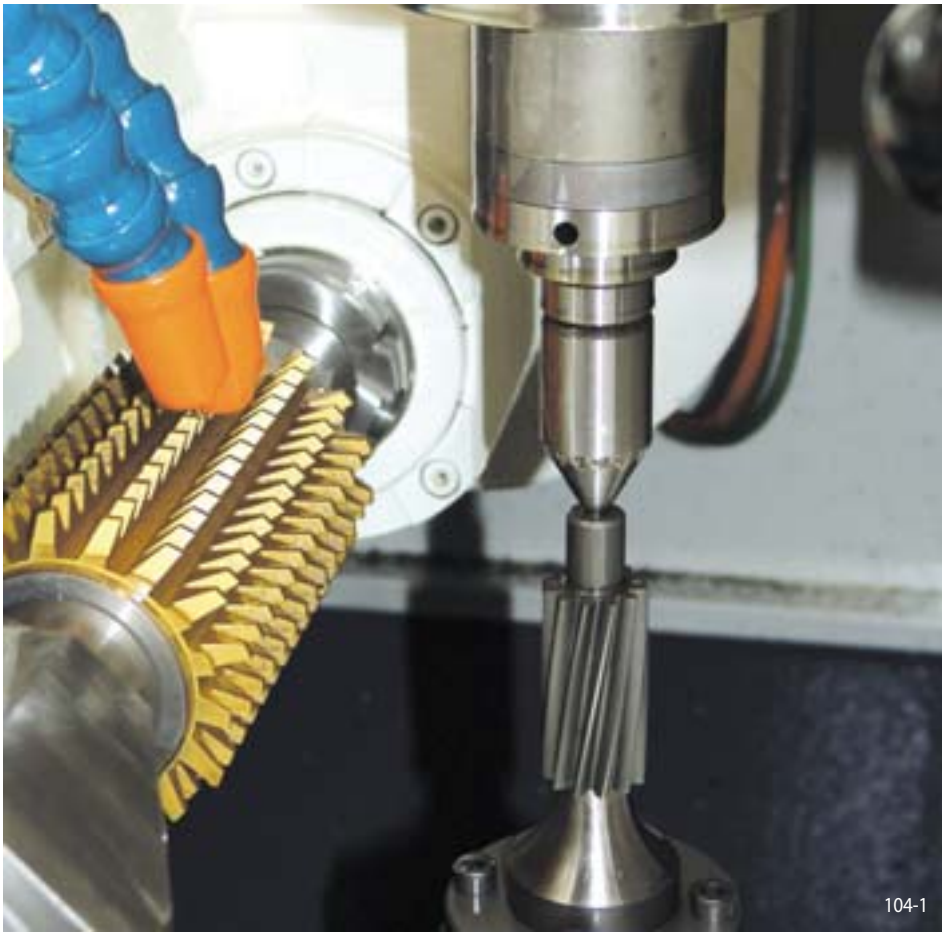
Two Taper Collets (4, 6) are actuated by spring pressure. This ensures that the housing is first pressed against the backstop ring (7) and aligned. The upper Taper Collet (6) serves as a second centring point. The clamping system is released by hydraulic pressure.

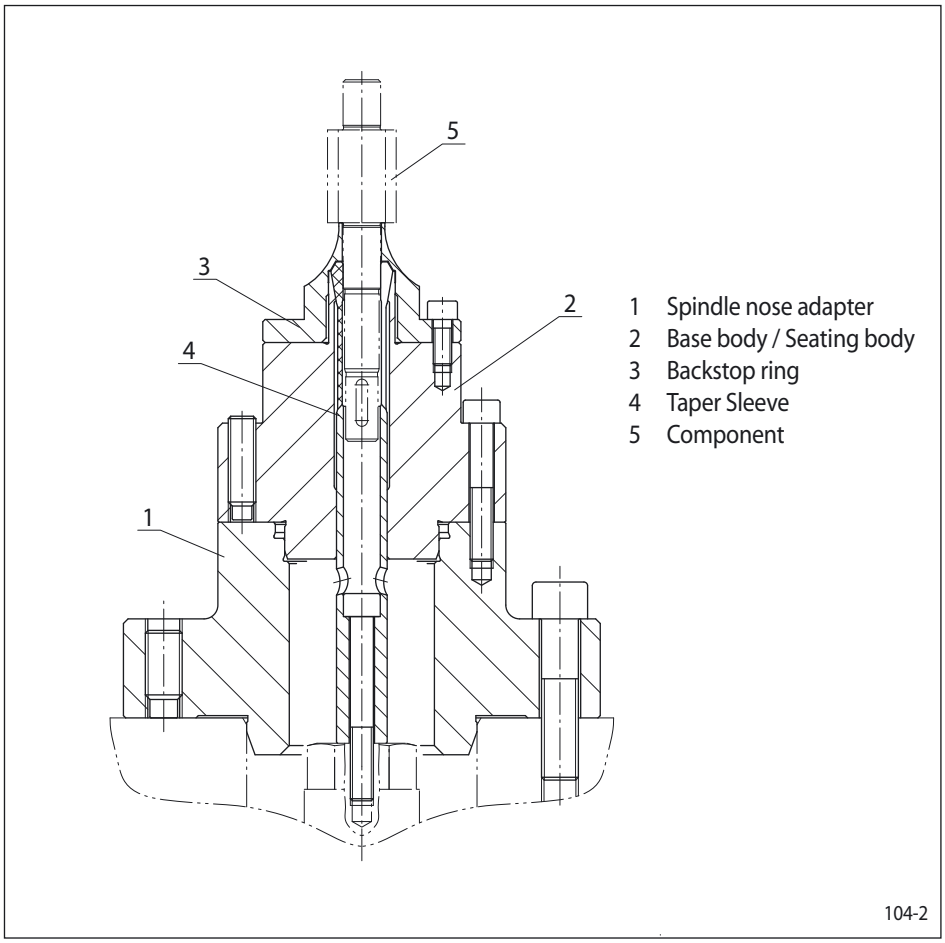
Clamping principle



Application examples

Pump wheel





Component

Pump wheel

Type of machine

Milling machine

Machining

Milling of tooth flank

Task

Clamping the pump wheel on its shaft end with maximum true running accuracy

Our solution

- Taper Sleeve Flange Chuck with spacer bushes adapted to the existing clamping tool
- Power activated

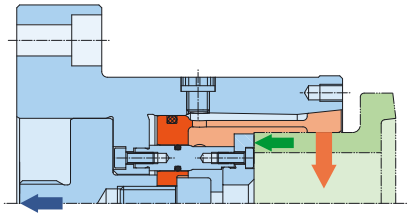
Customer benefit

- Set-up time reduced to a fraction of time previously required
- Substantial gain in accuracy
- Reduction of scrap rate
- Easy handling
- Process reliability ensured even when operated by untrained personnel
- Taper Sleeve Flange Chucks are also used for grinding operations

Brief description

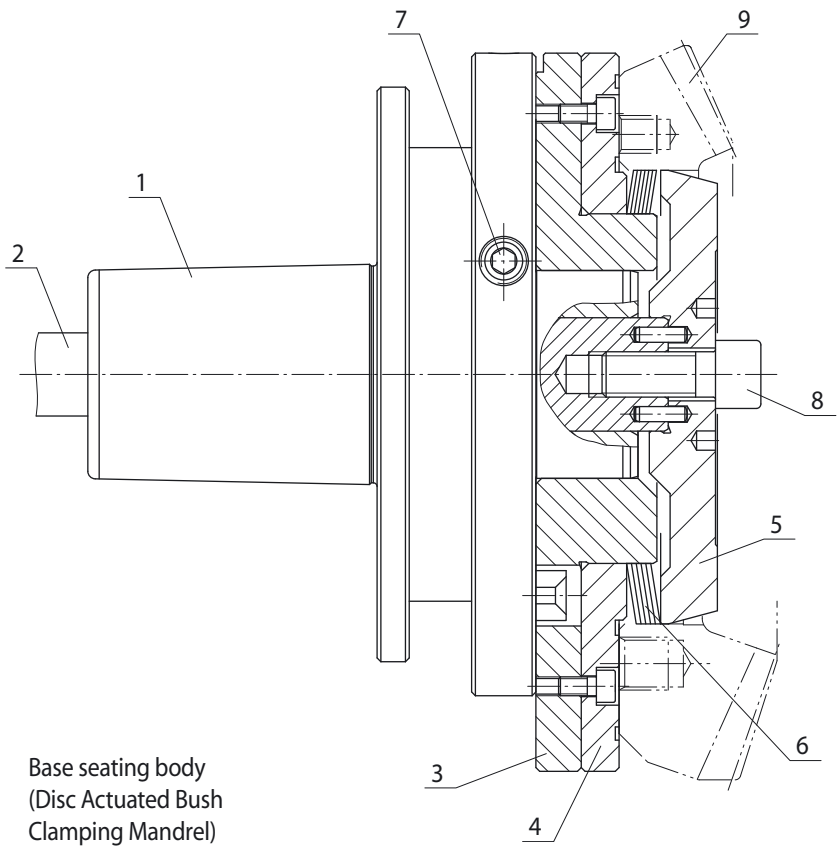
The Taper Sleeve Flange Chuck engages the journal end of the pump wheel (5), raises it to an upright position and clamps it. The makes it possible to transmit high torque. The component is also centered and stabilized at the opposite end with the aid of a sleeve.

Clamping principle



Application examples

Crown wheel



1 Base seating body (Disc Actuated Bush Clamping Mandrel)
2 Tie rod to machine drawbar
3 Seating body flange
4 Backstop ring
5 Mushroom cover
6 Bonded Disc Pack
7 Radial clamping screw
8 Screw
9 Component

105-2

Component
Crown wheel

Type of machine
Lapping and testing machine

Machining
Lapping and testing of gear teeth

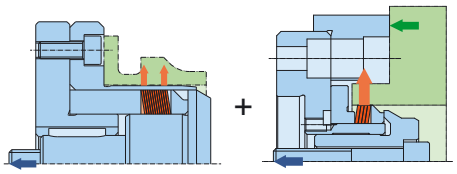
Task
Clamping of crown wheels with possibility of quick change to different clamping diameters

Our solution
- Disc Actuated Bush Clamping Mandrel as base seating body
- Bonded Disc Pack Flange Mandrel as interchangeable clamping sets
- Power activated

Customer benefit
- Quick change to different clamping diameters without loss of accuracy
- No precise positioning action necessary as the base seating body remains on the spindle
- One Clamping Fixture for different crown wheels

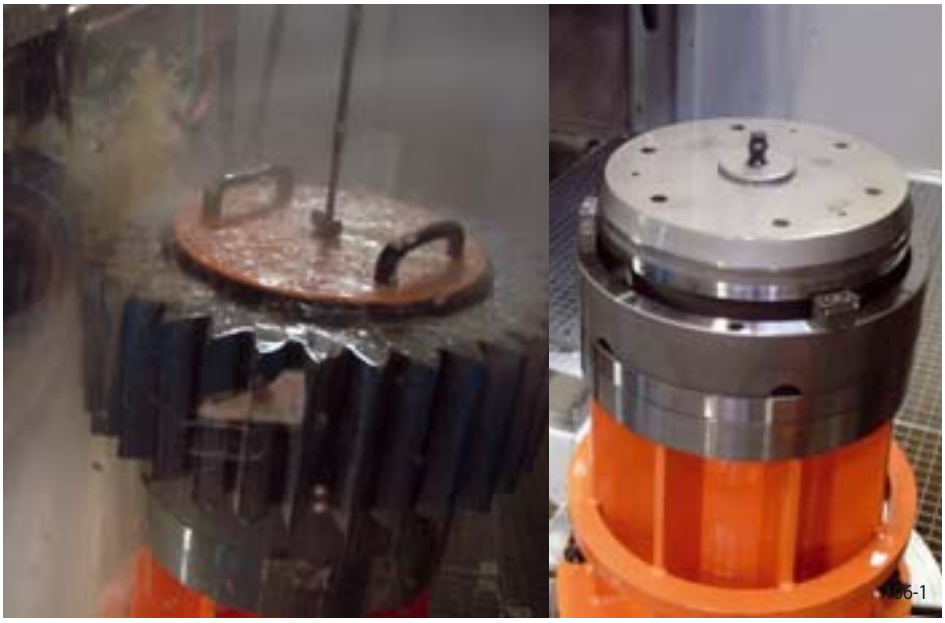
Brief description
The base seating body (1), configured as an Disc Actuated Bush Clamping Mandrel, remains permanently in the lapping and testing machine. The Disc Actuated Bush Clamping Mandrel (1) centres and clamps the various replaceable clamping sets consisting of a base body flange (3), a backstop ring (4), a Bonded Disc Pack (6) and a mushroom cover (5). The force required to clamp the crown wheel (9) is provided by the machine tie rod (2). The mushroom cover (5) engages the Bonded Disc Pack (6), which centres the crown wheel (9), aligns it through pull-back action and clamps it. Axial and radial runout are less than 0,006 mm. The entire replaceable clamping set can be removed for replacement by loosening the radial clamping bolt (7) on the Disc Actuated Bush Clamping Mandrel (1) and the central bolt on the mushroom cover. The operation can be complted in just a few minutes. Thus this system is also suitable for the economically efficient production of small lots.

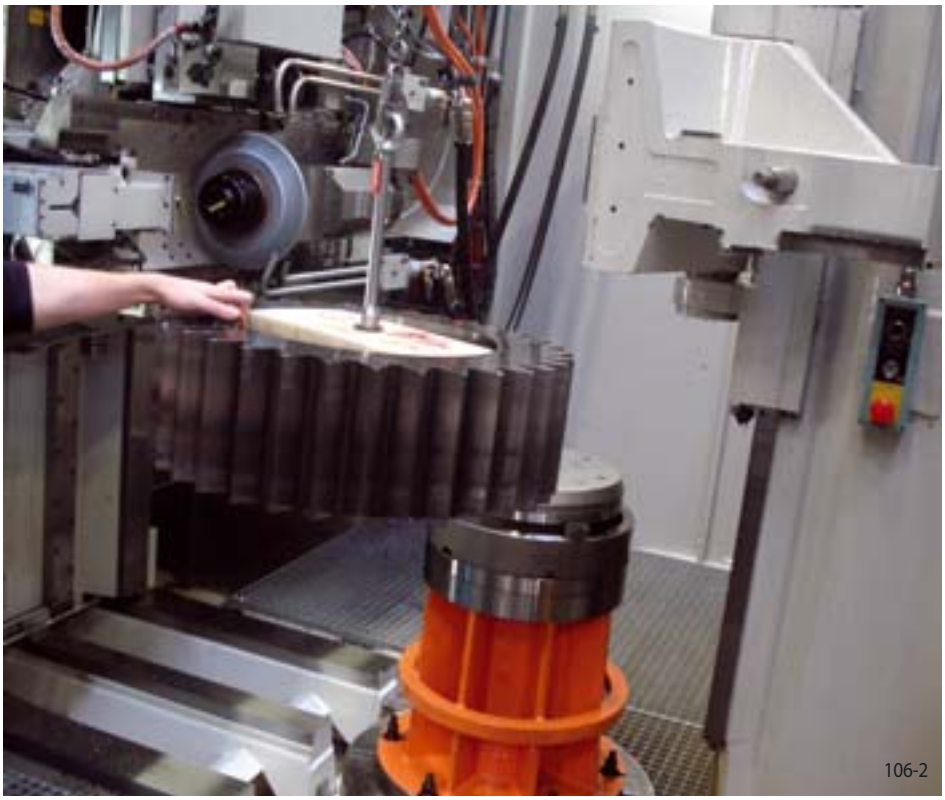
Clamping principle



Application examples

Gear wheel for a wind turbine transmission





Component

Gear wheel for a wind turbine transmission

Type of machine

Grinding machine

Machining

Grinding of tooth flank

Task

- Central component alignment, max. weight 1 000 kg
- Clamping for machining torque transmission

Our solution

- Flat Element Flange Mandrel
- Power activated

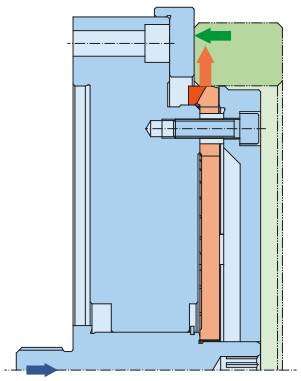
Customer benefit

- Centering accuracy ≤ 0,01 mm in spite of heavy component weight
- True running accuracy ≤ 0,02 mm
- Poweractuating with actuating force reduction
- Cover with pre-centring

Brief description

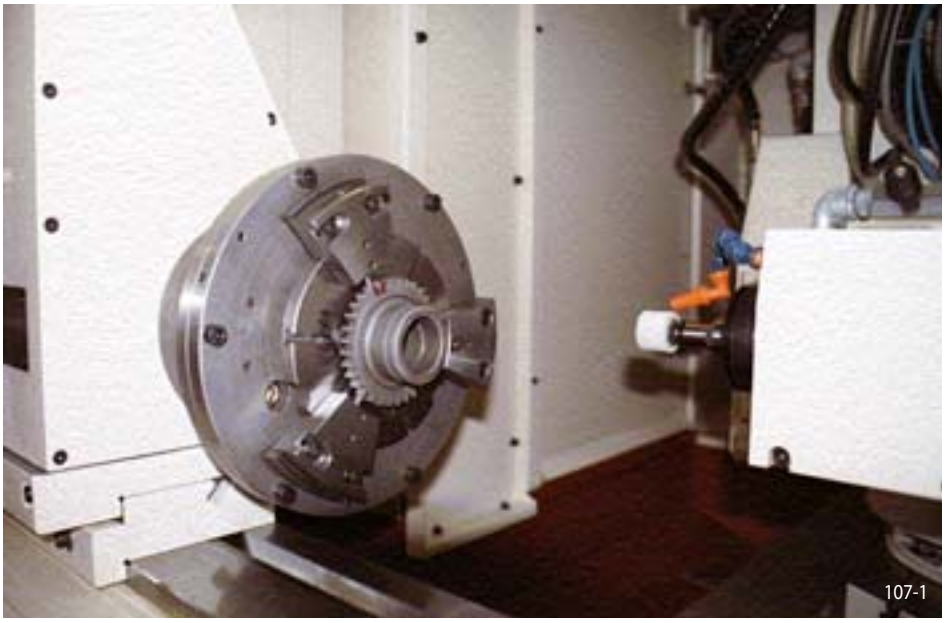
The Clamping Fixture is actuated when pressure is applied. Because the minimal programmable actuating force of the machine is greater than the maximum permissible force for the Flat Element, an actuating force limiter is positioned between the power clamping device of the machine and the thrust bolt of the Flat Element Flange Mandrel. This consists of two telescope sleeves with disc springs positioned in between. The Flat Element Flange Mandrel exerts a very high radial force which securely centres and clamps the gear wheel in spite of its substantial weight. The cover is equipped with an insertion groove, in order to facilitate the loading of heavy components.

Clamping principle



Application examples

Gear wheel



Component
Gear wheel

Type of machine
ID grinding machine

Machining
Grinding of central bore hole

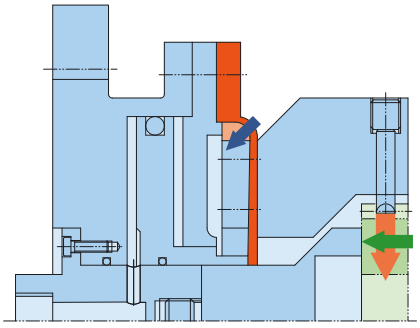
Task
- Centering and clamping in a gear wheel segment
- High true running accuracy

Our solution
- Unslotted Diaphragm Clamping Chuck
- Actuated by intrinsic clamping element spring force

Customer benefit
- True running accuracy ≤ 0,01 mm
- Reproduction accuracy ≤ 0,005 mm

Brief description
The gear wheel is clamped by pins in the gear-tooth segment. The Clamping Element Unslotted Diaphragm is actuated by pneumatic pressure. This causes the mounted jaws in which the clamping pins are located to tip and release the component. When pneumatic pressure is removed, the Clamping Element Unslotted Diaphragm returns to its original position and clamps the component.

Clamping principle



Application examples

Turbine stage of a jet engine

Component

Turbine stage of a jet engine

Type of machine

Balancing machine

Machining

Balancing performance testing

Task

The objective is to centre and clamp the various turbine stages in the entire low pressure range of an aircraft engine with the greatest possible precision with minimum setup time.

Our solution

- Segmented Diaphragm Clamping Chuck with interchangeable set of jaws as chuck and mandrel
- Manually activated

Customer benefit

- Set-up time under 7 minutes (clamping diameter 1 600 mm)
- True running accuracy ≤ 0,02 mm
- Reproduction accuracy ≤ 0,005 mm

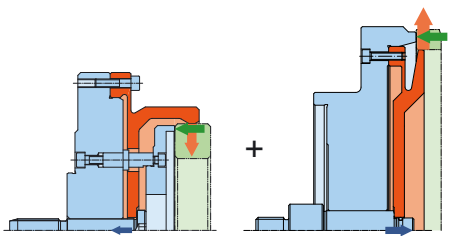
Brief description

Because the Segmented Diaphragm Clamping Chuck is a lightweight unit, it does not overload the balancing machine. Jaws are mounted and bolted to the Segmented Diaphragm. To change the jaws, only one bolt needs to be loosened on each Segmented Diaphragm before moving the jaw on the circumference side. The Segmented Diaphragm Clamping Chuck remains on the machine spindle. Only the jaws are replaced.

Patent number

DE 197 56 112

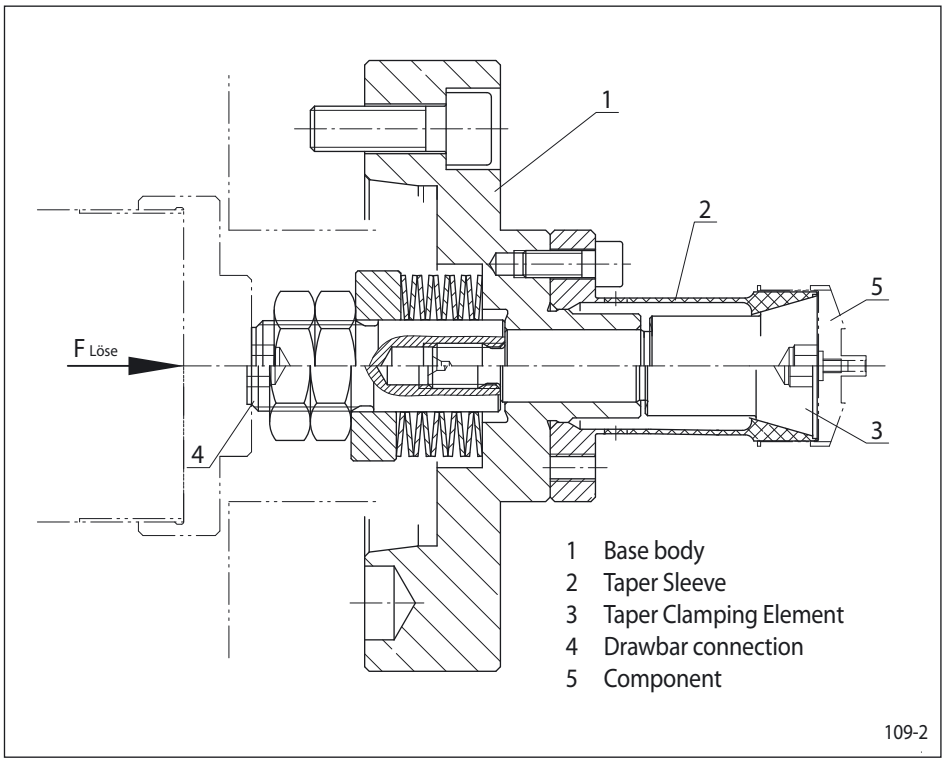
Clamping principle



Application examples

Thin-walled metering nozzle cover

109-1



109-2

Component

Thin-walled aluminium cover for charging blast pipe for production of medical apparatus with milled surfaces

Type of machine

Production lathe

Machining

Outside contour turning, pocket trimming and milling

Task

- Precise component positioning
- No damage to cover resulting from clamping
- Exact axial and angular position of each cover

Our solution

- Taper Sleeve Flange Mandrel without pull-back action
- Spring activated

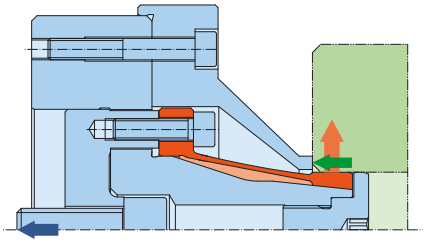
Customer benefit

The ultra-sensitive component is held in a reproducible position without resulting dents or deformation. Processing torques are reliably transmitted.

Brief description

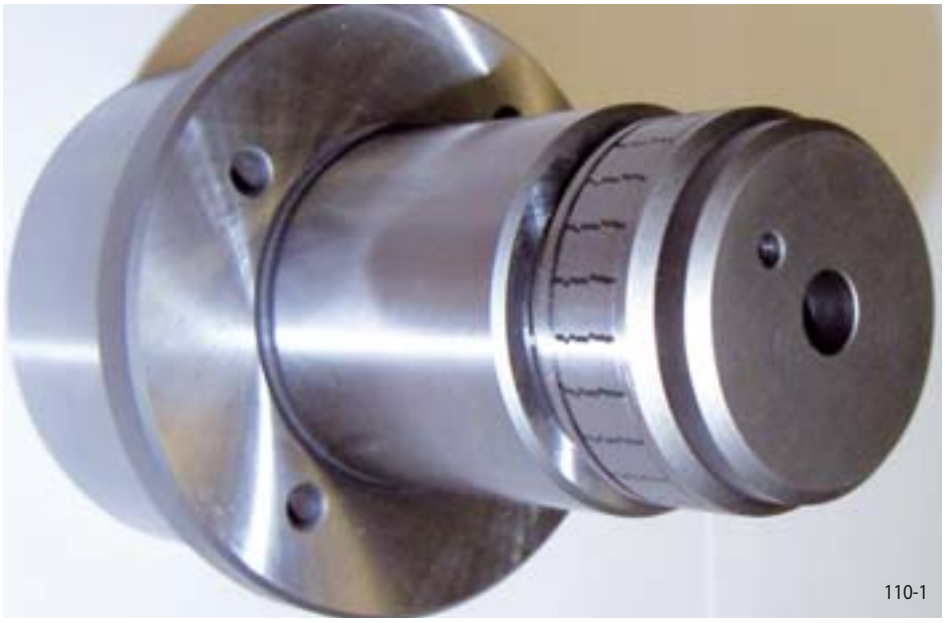
The Taper Sleeve Flange Mandrel takes up the component (5) after the first turning operation. This is followed by trimming and the subsequent turning and machining operations. The wolfram-carbide coating on the Taper Sleeve (2) and the fine adjustment of clamping forces via the pre-loaded disc spring permit very short cycle times with long service life and consistently good machining results.

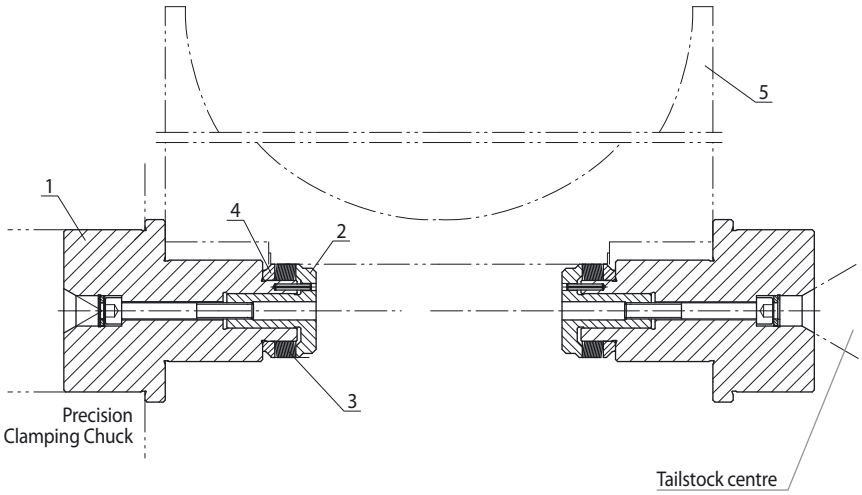
Clamping principle



Application examples

Forming roller for profile rolling mills





1 Seating body
2 Mushroom bush
3 Bonded Disc Pack
4 Thrust ring
5 Roller (Component)

110-2

Component

Forming roller for profile rolling mills

Type of machine

Lathe

Machining

Contour machining

Task

Rework or remanufacturing of form roller

Our solution

- Bonded Disc Pack Clamping Mandrel
- Manually activated

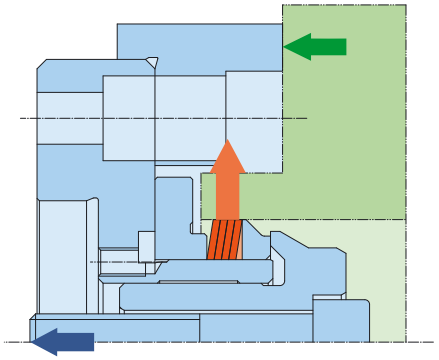
Customer benefit

- Very short set-up time
- High true running accuracy
- Application independent of component length
- Long service life

Brief description

Mounting in the tolerance bores on both sides of the of the form roller (5). The Bonded Disc Pack Clamping Mandrel on the left transmits the torque required for processing. It is held by a precision base chuck. The Bonded Disc Pack Clamping Mandrel on the right is centred with a tailstock pin.

Clamping principle



Notes / sketches

Technical points

for customer assembly with RINGSPANN Clamping Elements

Installation and commissioning

- Clamping Discs, Bonded Disc Packs, Disc Elements, Taper Collets, Taper Sleeves, Flat Elements, Basket Elements or Short Elements are coated with a light coat of oil and pressed onto the seating diameter.
- In the case of Basket Elements, Short Elements and Flat Elements, the Clamping Element must first be pressed with a portion of its circumference into the seating diameter. It is then gradually driven along its entire circumference into the seating diameter by applying careful, inward blows with a rubber hammer.

When installing RINGSPANN Clamping Elements, it is important to ensure that they contact firmly against the entire circumference of the axial backstop.

Maximun true running accuracy is achieved by clamping and releasing the fixture once without a component and then three times with a component after installation and before component processing begins.

No shifting of position on the seating diameter

The Clamping Fixtures must be designed in such a way as to ensure that the Clamping Elements cannot shift position on the seating diameter either during clamping or during release.

Axial component pull-back

Axial pull-back is required for processing a component in accordance with the true running accuracy specifications set by RINGSPANN. It is important to ensure that the contact surface moves without impact to the the clamping diameter and the component contact to the surface with the maximum possible diameter. In order to prevent soiling, the backstop ring surfaces should be as narrow as possible or unslotted. If backstop pins are used, they must be ground without axial and radial runout.

In the event that "runout" cannot be restricted through constructive measures, clamping must be effected at two centring points positioned as far apart as possible. We recommend using a cardanic ring (pendle ring) as a backstop. Maximum possible true run accuracy of Clamping Fixtures cannot be achieved with ball discs and bevel socket washers in accordance with DIN 6319 as moving backstops.

Sealing, chip removal

Rubberized RINGSPANN Clamping Elements (except for Taper Collets) are protected against the ingress of chips and dirt. In the case of vertically positioned chucks, cavities and bores for complete chip removal must be provided.

Material and hardness

Clamping Fixtures are made of case-hardened steel for maximum effectiveness. Components which come in contact with Clamping Elements are inserted and hardened:

- Hardness rating HRc 62 ± 2
- Hardening depth after grinding 0,5 mm

Required transmissible machining torques

We recommend the Kienzle computation method for the calculation of required transmissible machining torques.

In balancing operations, the mass moment of inertia during accelerating/braking (emergency cutoff) is the crucial factor.

Machines with automatic component loading features

In order to facilitate the component feed to machines with automatic component loading units, we recommend an insertion chamfer on the component, provided this is technically feasible. It may also be useful to construct Clamping Elements with insertion chamfers (custom manufacture). With machines of this kind, it is essential to ensure that the Clamping Fixture is properly sealed and free of chips. It may be necessary to enlarge the insertion play of the clamping diameter (the standard is e6 of the smallest dimension of the component clamping diameter for mandrel clamping and E7 of the largest dimension for chuck clamping).

Technical points

for customer assembly with RINGSPANN Clamping Elements

Machine connection and actuating

The actuating forces listed in the tables discribe the load limit of the Clamping Element and must not be exceeded. If the force exerted by the actuating device cannot be reduced below the load limit of the Clamping Element, two constructive possibilities can be realized to reduce the actuating force applied to the Clamping Element:

1. Actuating force with spring washer pack:

The required actuating force is applied with spring washers. The power clamping unit is used to release the Clamping Fixture by pressing the spring washers together and thus reducing the actuating force. When using rubberized Clamping Elements it is important to ensure that they are always stored or shut down after the completion of work with relaxed Clamping Elements or with clamped components (or control rings) in order to prevent relaxation of the rubber covering on the Clamping Elements.

2. Reducing the actuating force with an intermediate spring washer pack:

In this possibility, the actuating force is reduced and applied by an intermediate spring washer pack.

The values for actuating forces (longitudinal forces) and transmissible torques listed in the tables are virtually proportional.

Verification of selected Clamping Elements

Transmissible torque, required actuating force, specific pressure

The required actuating forces for the selected Clamping Elements are calculated in this section. Actuating forces F, F_o or F_m and F_{on} or F_{mn} for transmission of the maximum possible torques M, M_1 and M_n are shown in the table. These maximum forces may not be exceeded.

The following apply to Clamping Discs:

$$M = n \cdot M_1 \quad [Nm]$$

$$F_o = n \cdot F_{o1} \quad [N]$$

$$F_m = n \cdot F_{m1} \quad [N]$$

n = number Clamping Discs (max. 16)

If the actuating forces are lower than the maximum forces, transmissible torque M is reduced and the specific pressure between the Clamping Element and the component is reduced proportionally (down to half of catalogue values). This may be necessary in cases involving

- thin-walled components,
- soft materials,
- sensitive components surfaces and
- slotted component clamping surfaces.

Axial holding force

The axial holding force F_{ax} is derived from the catalogue values of "transmissible torque M" and "clamping diameter D".

$$F_{ax}\,[N] = \frac{M\,[Nm] \cdot 1\,000\,[^{mm}/_{m}]}{^{D}/_{2}\,[mm]}$$

Clamping accuracy

If all functional surfaces of a Clamping Fixture are free of radial and axial rounout, the achievable true run accuracy is:

- up to clamping diameter of 300 mm: 0,01 mm (0,005 mm centre misalignment),
- over a clamping diameter of 300 mm: 0,02 mm (0,010 mm centre misalignment).

If greater accuracy is required, all Clamping Fixture components (and possibly the Clamping Element) must be prevented from twisting. The following procedure must be employed:

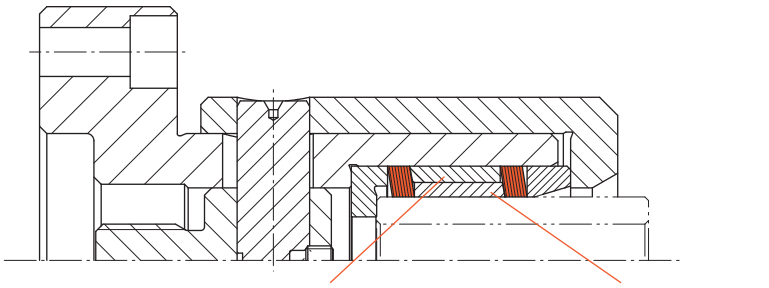
1. Alignment of the Clamping Fixture on the machine spindle with the aid of a master component. Radially adjustable setting screws should be provided as alignment aids.
2. In the case of fixtures with rigid centring, both the slightly pre-loaded Clamping Elements and the axial contact surfaces must be lightly ground to the exact clamping diameter.

Dimension control

Due to their elasticity, dimension control of RINGSPANN Clamping Elements that have not been installed is not possible. Dimension control cannot be performed until the Clamping Fixture has been assembled, as the Clamping Elements are pre-loaded.

Multiple clamping points

Engineering design and the calculation of forces and torques for Clamping Fixtures with two or more clamping points are very complex. We recommend having such Clamping Fixtures produced entirely by RINGSPANN. Please complete the questionnaire on page 119 and send it to us.



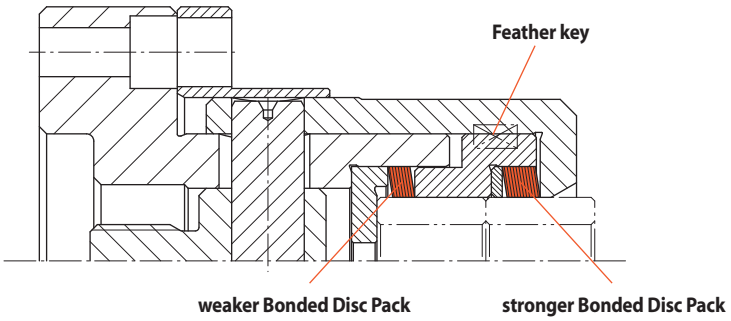
114-1

Parallel Bonded Disc Pack Flange Chucks

to transmit high operating torque and for clamping in long bores with tolerance ≤ IT7

Functional principle

The upright parallel clamping bush remains stationary and retains the Bonded Disc Pack in position, the actuating bush transmits the actuating force by axial movement.



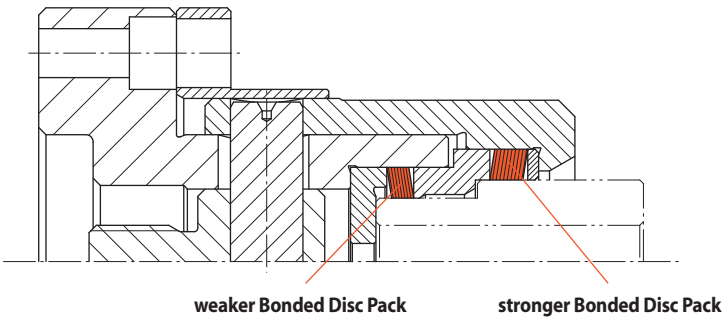
114-2

Series Bonded Disc Pack Flange Chuck

for clamping two identical components

Functional principle

The weaker Bonded Disc Pack is raised first. It clamps the first component. Then the stronger Bonded Disc Pack is raised and clamps the second component. Alignment with the first component is achieved through pull-back action.



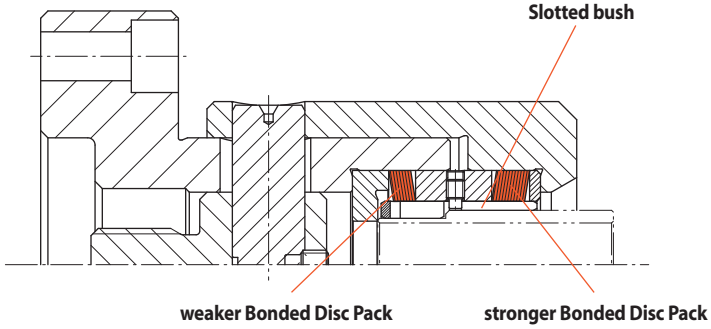
114-3

Direct Differential Bonded Disc Pack Flange Chuck

for clamping components with two diffrent clamping diameters.

Functional principle

The weaker Bonded Disc Pack is raised first. It centres the component and presses it against the backstop surface for alignment. Only then does the stronger Bonded Disc Pack centre the component at the second clamping point.



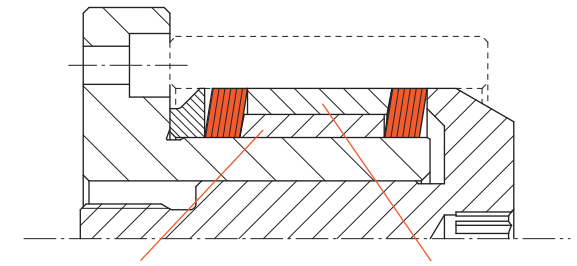
114-4

Indirect Differential Bonded Disc Pack Flange Chuck

for clamping components with two different clamping diameters on sensitive surface.

Functional principle

The weaker Bonded Disc Pack is raised first. It centres the component and presses it against the backstop surface for alignment. Only then does the stronger Bonded Disc Pack centre the component. By changing the slotted bush different components can be clamped.



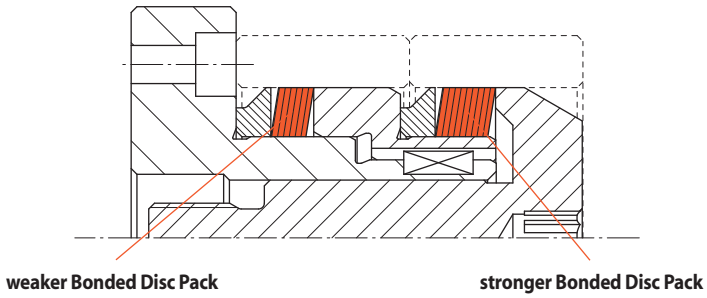
115-1

Parallel Bonded Disc Pack Flange Mandrel

to transmit high operating torque and for clamping in long bores with tolerance ≤ IT7

Functional principle

The upright parallel clamping bush remains stationary and retains the Bonded Disc Pack in position, the actuating bush transmits the actuating force by axial movement.



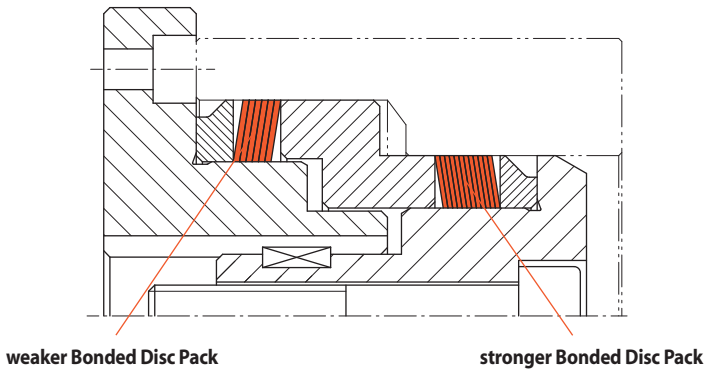
115-2

Series Bonded Disc Pack Flange Mandrel

for clamping two identical components

Functional principle

The weaker Bonded Disc Pack is raised first. It clamps the first component. Then the stronger Bonded Disc Pack is raised and clamps the second component. Alignment with the first component is achieved through pull-back action.



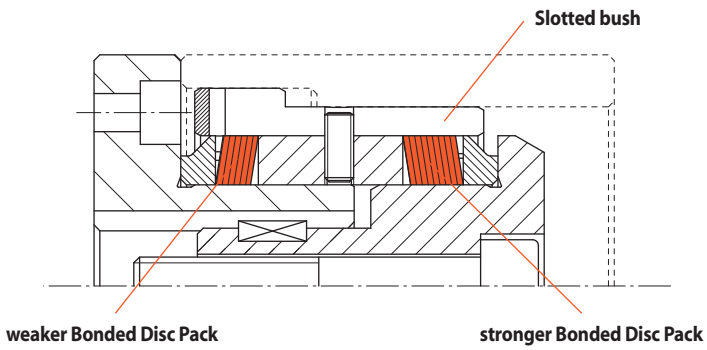
115-3

Direct Differential Bonded Disc Pack Flange Mandrel

for clamping components with two diffrent clamping diameters.

Functional principle

The weaker Bonded Disc Pack is raised first. It centres the component and presses it against the backstop surface for alignment. Only then does the stronger Bonded Disc Pack centre the component at the second clamping point.



115-4

Indirect Differential Bonded Disc Pack Flange Mandrel

for clamping components with two different clamping diameters on sensitive surface.

Functional principle

The weaker Bonded Disc Pack is raised first. It centres the component and presses it against the backstop surface for alignment. Only then does the stronger Bonded Disc Pack centre the component. By changing the slotted bush different components can be clamped.

Technical points

for customer assembly with Bonded Disc Packs and Clamping Discs

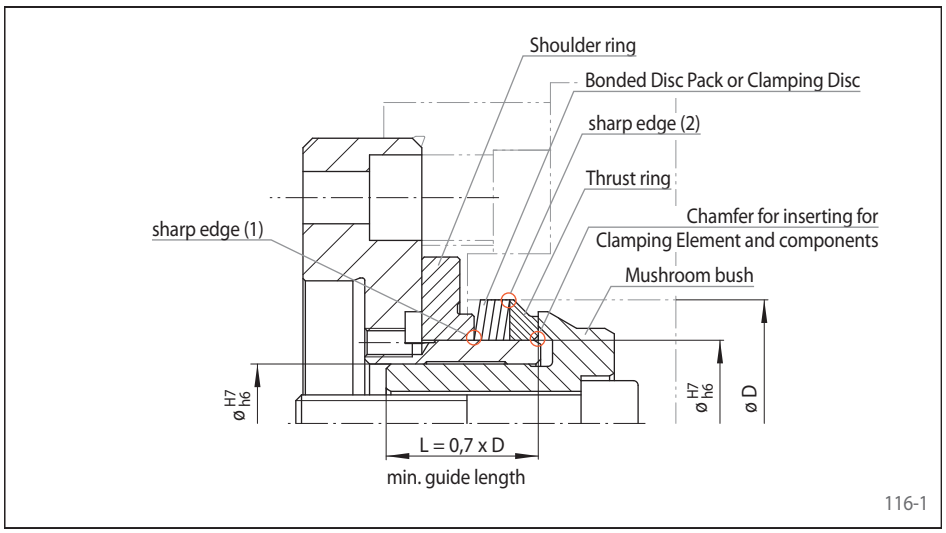
Guide length

In order to achieve a uniform enlargement or reduction of the clamping diameter around the entire circumference, a guide length of $L \geq 0{,}7 \cdot D$ must be ensured for guide bushes, mushroom bushes, differential clamping bushes and intermediate bushes. D is the clamping diameter of the RINGSPANN Clamping Disc. In the case of Clamping Chucks, the actuating force can be achieved with a threaded ring. The threading on the chuck body and on the threaded ring must be free of play and runout against the functional surfaces. Achievable true run accuracy is much lower when threaded rings are used, however.

No chamfers and radii

The transition from the seating diameter to the contact suface for RINGSPANN Bonded Disc Packs or Clamping Discs must have a sharp edge (1) without rounding and without undercuts. This can be achieved by employing a sharp-edge ring, e.g. shoulder ring that covers the undercut.

The part that is pressed flat by the RINGSPANN Bonded Disc Packs or Clamping Discs, e.g. thrust ring during clamping must also have a runout-free ground circumferential sharp edge (2) in order to ensure that the entire circumferenc is pressed uniformly flat.



Fitting tolerances

Parts which slide against each other are produced with a fit tolerance of H7/h6. All parts must be checked for ease of movement. In order to avoid fit play, moveable bushes in or on which RINGSPANN Clamping Elements are seated must fit without clearance or in counter components. Thin-walled bushes can be deformed by pressure exerted by RINGSPANN Clamping Discs. Potential clamping can be prevented by free rotation inside the play-free glide surfaces in the seat area of the RINGSPANN Clamping Discs. In the case of Clamping Mandrels and Clamping Chucks, all diameters to which the component leads must be deisgned in accordance with the grinding dimension plus the tolerance (e6 or E7) of the Clamping Element.

No inadvertent expanding

When mounting components, it is essential to ensure that inadvertent expanding of the Bonded Disc Packs or Clamping Discs is avoided. Such expanding may be caused by impact of the component against the thrust ring or the mushroom bush. This problem applies especially to automatic loading systems. In this case, we advise against using thrust rings and special mushroom bushes (for mandrel clamping) and draw bushes (for chuck clamping). In the released position these special bushes must be held in axial position by the power clamping system, by springs or by other suitable means.

Maximum number of discs per pack

In the case of Clamping Disc packs with a large number of Clamping Discs, the Clamping Discs farthest from the source of axial force play only a reduced role in force transmission.

A useful simplified rule is that discs in excess of a total of 16 contribute only about 50% to force transmission. Therefore, a number of discs must be added which is equavalent to calculated number of discs in excess of 16. Disc packs with more than 25 discs should be avoided.

Transmissible torque, required actuating force

Parallel Bonded Disc Pack Clamping Fixtures

Parallel Bonded Disc Pack Clamping Fixtures grip the component at multiple clamping points of the same diameter. Bonded Disc Packs of equal thickness are used for this purpose. The total sum of all individual actuating forces exerted by the Bonded Disc Packs is required to actuate the Clamping Fixture. The total transmissible torque is equal to the sum of the transmissible torques of the Bonded Disc Packs.

Please consult with us with regard to configurations consisting of more than two Bonded Disc Packs.

Series Bonded Disc Pack Clamping Fixtures

Series Bonded Disc Pack Clamping Fixtures have two clamping points of equal diameter for gripping two identical components. The faces of both components must be in a parallel plane and runs without an error to the clamping diameter. When both components are clamped, both clamping points must be clamped in succession. This is achieved with the use of two disc packs of different thickness. The Bonded Disc Pack with the lower actuating force represents the actuating force of the Clamping Fixture. The thicker Bonded Disc Pack is clamped with the same actuating forces as the thinner Bonded Disc Pack. The simple transmissible torque of the thinner Bonded Disc Pack is applied to each clamping point.

Differential Bonded Disc Pack Clamping Fixtures

Differential Bonded Disc Pack Clamping Fixtures grip the component at two clamping points, which may have different diameters. When clamping the component, as with Series Bonded Disc Pack Clamping Fixtures, the individual clamping points are clamped in succession. This is achieved with the use of two Bonded Disc Packs of different thickness. The Bonded Disc Pack with the lower actuating force represents the actuating force of the Clamping Fixture and contributes its full catalogue torque to torque transmission. The thicker Bonded Disc Pack is clamped with the same actuating force as the thinner Bonded Disc Pack. The total transmissible torque of the clamping device is calculated as follows in units equipped with **an anti-twist lock** for the moveable seat of the broad Bonded Disc Pack.

$$M = M_{I} + M_{IIred} = M_{I} + M_{II} \frac{F_{mI}}{F_{mII}} \quad [Nm]$$

Definition of terms used in this equation:

F_{mI} = required actuating force of the thinner Bonded Disc Pack

F_{mII} = required actuating force of the thicker Bonded Disc Pack

M_{I} = maximum transmissible torque of the thinner Bonded Disc Pack

M_{IIred} = transmissible torque of the thicker Bonded Disc Pack at reduced actuating force F_{mI}

M_{II} = maximum transmissible torque of the thicker Bonded Disc Packs

Basic tolerances

Nominal dimensional range over … to mm	Basic tolerance degrees															
	IT1	IT2	IT3	IT4	IT5	IT6	IT7	IT8	IT9	IT10	IT11	IT12	IT13	IT14	IT15	IT16
	Basic tolerance															
	µm											mm				
to 3	0,8	1,2	2,0	3	4	6	10	14	25	40	60	0,10	0,14	0,25	0,40	0,6
3 … 6	1,0	1,5	2,5	4	5	8	12	18	30	48	75	0,12	0,18	0,30	0,48	0,75
6 … 10	1,0	1,5	2,5	4	6	9	15	22	36	58	90	0,15	0,22	0,36	0,58	0,9
10 … 18	1,2	2,0	3,0	5	8	11	18	27	43	70	110	0,18	0,27	0,43	0,70	1,1
18 … 30	1,5	2,5	4,0	6	9	13	21	33	52	84	130	0,21	0,33	0,52	0,84	1,3
30 … 50	1,5	2,5	4,0	7	11	16	25	39	62	100	160	0,25	0,39	0,62	1,00	1,6
50 … 80	2,0	3,0	5,0	8	13	19	30	46	74	120	190	0,30	0,46	0,74	1,20	1,9
80 … 120	2,5	4,0	6,0	10	15	22	35	54	87	140	220	0,35	0,54	0,87	1,40	2,2
120 … 180	3,5	5,0	8,0	12	18	25	40	63	100	160	250	0,40	0,63	1,00	1,60	2,5
180 … 250	4,5	7,0	10,0	14	20	29	46	72	115	185	290	0,46	0,72	1,15	1,85	2,9
250 … 315	6,0	8,0	12,0	16	23	32	52	81	130	210	320	0,52	0,81	1,30	2,10	3,2
315 … 400	7,0	9,0	13,0	18	25	36	57	89	140	230	360	0,57	0,89	1,40	2,30	3,6
400 … 500	8,0	10,0	15,0	20	27	40	63	97	155	250	400	0,63	0,97	1,55	2,50	4,0
500 … 630	9,0	11,0	16,0	22	32	44	70	110	175	280	440	0,70	1,10	1,75	2,80	4,4
630 … 800	10,0	13,0	18,0	25	36	50	80	125	200	320	500	0,80	1,25	2,00	3,20	5,0
800 … 1 000	11,0	15,0	21,0	28	40	56	90	140	230	360	560	0,90	1,40	2,30	3,60	5,6
1 000 … 1 250	13,0	18,0	24,0	33	47	66	105	165	260	420	660	1,05	1,65	2,60	4,20	6,6
1 250 … 1 600	15,0	21,0	29,0	39	55	78	125	195	310	500	780	1,25	1,95	3,10	5,00	7,8

Limits for selected tolerance ranges

Nominal dimension mm	E7 µm	H7 µm	e6 µm	h6 µm
	+ 24	+ 10	– 14	0
to 3	+ 14	0	– 20	– 6
over 3	+ 32	+ 12	– 20	0
to 6	+ 20	0	– 28	– 8
over 6	+ 40	+ 15	– 25	0
to 10	+ 25	0	– 34	– 9
over 10	+ 50	+ 18	– 32	0
to 18	+ 32	0	– 43	– 11
over 18	+ 61	+ 21	– 40	0
to 30	+ 40	0	– 53	– 13
over 30	+ 75	+ 25	– 50	0
to 50	+ 50	0	– 66	– 16
over 50	+ 90	+ 30	– 60	0
to 80	+ 60	0	– 79	– 19
over 80	+ 107	+ 35	– 72	0
to 120	+ 72	0	– 94	– 22
over 120	+ 125	+ 40	– 85	0
to 180	+ 85	0	– 110	– 25
over 180	+ 146	+ 46	– 100	0
to 250	+ 100	0	– 129	– 29
over 250	+ 162	+ 52	– 110	0
to 315	+ 110	0	– 142	– 32
over 315	+ 182	+ 57	– 125	0
to 400	+ 125	0	– 161	– 36
over 400	+ 198	+ 63	– 135	0
to 500	+ 135	0	– 175	– 40
over 500	+ 215	+ 70	– 145	0
to 630	+ 145	0	– 189	– 44
over 630	+ 240	+ 80	– 160	0
to 800	+ 160	0	– 210	– 50
over 800	+ 260	+ 90	– 170	0
to 1000	+ 170	0	– 226	– 56

Excerpt from VDI 2230, Page 1, issue of February 2003

Dimension	Assembly pretensioning force $F_{M\,Tab}$ in kN for $\mu_G = 0{,}12$			Tightening torques M_A in Nm for $\mu_K = \mu_G = 0{,}12$		
	Property classes			Property classes		
	8.8	10.9	12.9	8.8	10.9	12.9
M 4	4,4	6,5	7,6	3,0	4,6	5,1
M 5	7,2	10,6	12,4	5,9	8,6	10,0
M 6	10,2	14,9	17,5	10,1	14,9	17,4
M 7	14,8	21,7	25,4	16,8	24,7	28,9
M 8	18,6	27,3	32,0	24,6	36,1	42,2
M 10	29,6	43,4	50,8	48	71	83
M 12	43,0	63,2	74,0	84	123	144
M 14	59,1	86,7	101,5	133	195	229
M 16	80,9	118,8	139,0	206	302	354
M 18	102	145	170	295	421	492
M 20	130	186	217	415	592	692
M 22	162	231	271	567	807	945
M 24	188	267	267	714	1017	1190

Assembly pre-loading force $F_{M\,Tab}$ and tightening torques M_A at v = 0,9. For shaft screws with standard metric threading in accordance with DIN ISO 262. Head dimensions of hex screws in accordance with DIN EN ISO 4014 - 4018, socket hex screws in accordance with DIN 34800 and cylinder screws in accordance with DIN EN ISO 4762 and "medium" bore as defined in DIN EN 20273. • µG = thread, µK = screw head

Questionnaire for Precision Clamping Fixtures

Please photocopy or use the PDF-File from our website!

Company: .....
Address: .....
.....
Phone: .....
Fax: .....

Department: .....
Name: .....
Enquiry Ref.: .....
Date: .....
E-mail: .....

1. Component

Please send us your component drawing showing the following details:

1. Which surfaces are to be machined? (Please indicate in drawing)
2. Clamping diameter with tolerance: _____
3. Which end surface can be used as an axial backstop? (Please indicate in drawing)
4. Permissable TIR between clamping diameter and machined diameters: _____
5. Material: _____
6. Hardened: ❑ Yes ❑ No
7. Number to be machined per year: _____
8. Does the backstop surface run true in relation to the clamping diameter? ❑ Yes ❑ No

2. Function

1. Clamping tool is intended for:
   - ❑ Turning
   - ❑ Boring
   - ❑ Milling
   - ❑ Grinding
   - ❑ Balancing
   - ❑ Checking
   - ❑ _____
2. Max. Speed: _____ min^{-1}
3. How many tools are engaged simultaneously? (Please enter in the component drawing and mark tools I, II, III, IV etc.)

Tool	I	II	III	IV
Cutting Depth (mm)				
Feed (mm/U)				

3. Machine

1. Type of machine: _____
2. Component axis:
   - ❑ horizontal
   - ❑ vertical
3. Clamping fixture mounting:
   - ❑ between centres
   - ❑ flange mounted
   - ❑ taper mounted
4. Standard designation of spindle flange, mounting taper: _____

   or drawing of spindle head, if necessary with connecting dimensions for pull or pushrod.
5. Adjustment range of power clamping fixture:
   draw from _____ N to _____ N
   pressure from _____ N to _____ N
6. Clamping actuation:
   - ❑ by central nut or screw (manual clamping)
   - ❑ through the hollow machine spindle (Power actuating by connecting with machine drawbar)
   - ❑ by tailstock pressure
   - ❑ by a central spring pack
   - ❑ actuating piston implemented into Clamping Fixture
   - ❑ _____
7. Which coolant do you use: _____

4. Requirements

Quantity required: _____

5. Enclosure

Component drawings, spindle head drawings, others: _____

RINGSPANN®
Workholding Technology

Precision Clamping Fixtures

Bonded Disc Packs
Precision Clamping Fixtures based on the unique method of the RINGSPANN Clamping Disc.

Catalogue 10

Taper Collets
Precision Clamping Fixtures for clamping thin or thick walled components on long clamping length.

Catalogue 10

Taper Sleeves
Precision Clamping Fixtures for clamping compact components with short or long clamping lengths.

Catalogue 10

Flat Elements
Very short Precision Clamping Fixtures for clamping thick walled components with large clamping diameter and very short clamping depths.

Catalogue 10

Clamping Clutches
For rapid changes and precise clamping of profile rollers or printing rollers in printing presses in gravure and flexographic printing.

Catalogue 10

RINGSPANN®
Power Transmission

Freewheels

Backstops
Automatic protection against reverse running of conveyor belts, elevators, pumps and fans.

Catalogue 84

Overrunning Clutches
Automatic engaging and disengaging of drives.

Catalogue 84

Indexing Freewheels
For gradual feed of materials.

Catalogue 84

Housing Freewheels
Automatic engaging and disengaging of multimotor drives for installations with continuous operation.

Catalogue 84

Cage Freewheels
For installation between customer-supplied inner and outer rings.

Catalogue 84

Brakes

Industrial Disc Brakes
Spring activated - pneumatically, hydraulically, electromagnetically or manually released.

Catalogue 46

Industrial Disc Brakes
Pneumatically activated - spring released.

Catalogue 46

Industrial Disc Brakes
Hydraulically activated - non-releasing or spring released.

Catalogue 46

Industrial Disc Brakes
Spring activated - hydraulically released.

Catalogue 46

Clamping Units
Spring activated - hydraulically or pneumatically released. For secure and precise positioning of piston rods.

Catalogue 46

Shaft-Hub-Connections

Two-part Shrink Discs
External clamping connection for simple and secure mounting without torque wrench.

Catalogue 36

Three-part Shrink Discs
External clamping connection for the fastening of hollow shafts on solid shafts.

Catalogue 36

Cone Clamping Elements
Internal clamping connection in small dimensions for high torques.

Catalogue 36

Star and Clamping Discs
Shaft-Hub-Connection for frequent clamping and release.

Catalogue 36

Star Spring Washers
Axial spring element for preloading of ball bearings.

Catalogue 36

Overload Clutches

Torque Limiters with Screw Face
Reliable overload protection for tough operating conditions.

Catalogue 45

Torque Limiters with Rollers
With double or single Rollers. Through ratcheting or disengaging, also for 360° synchronous running.

Catalogue 45

Torque Limiters with Balls
Reliable overload protection with maximum response accuracy. Also backlash free.

Catalogue 45

Torque Limiters with Friction Linings
RIMOSTAT® Torque Limiter for constant torque. Belleville Spring Torque Limiter for simple release.

Catalogue 45

Force Limiters
Reliable axial overload protection in piston rods.

Catalogue 45

Couplings

Flange-Couplings
Rigid, easily removable shaft coupling with backlash free cone clamping connections.

Catalogue 44

Rigid Couplings
Rigid, easily removable shaft coupling with backlash free cone clamping connection.

Catalogue 44

Flexible Couplings
Large, allowed radial and angular misalignements. Minimum resiliency.

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Large, allowed radial and angular misalignements. Minimum resiliency.

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