

ROTOCLAMP/DISKCLAMP

RotoClamp Inside



RotoClamp Outside



DiskClamp

ADVANTAGES

1

Pneumatic clamping with high forces

2

**Safety clamping RotoClamp Standard –
If the air supply fails then system clamps**

3

**The values of hydraulic clamping
are reached and exceeded**

4

**Low system costs in comparison
to hydraulics**

5

Simple installation

6

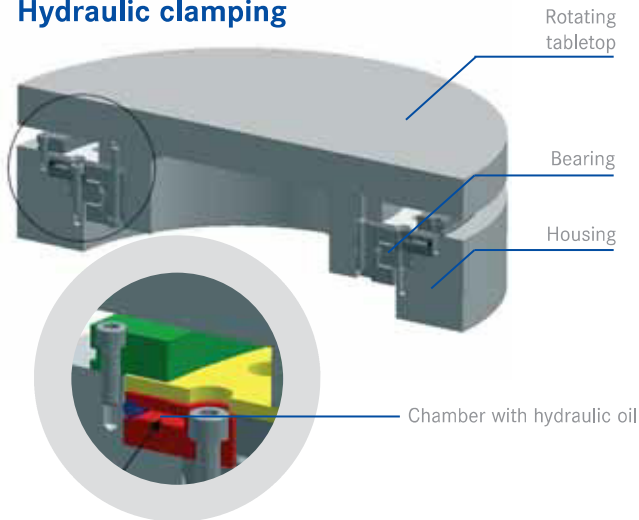
Compact design

7

Suitable for all shaft sizes

COMPARISON OF OPERATING PRINCIPLES

Hydraulic clamping



Operating principle of hydraulic clamping

Function The chamber formed by the expansion ring and the O-ring is supplied with hydraulic oil. The upper ring of the expansion ring is pressed upwards and away elastically and clamps the rotating brake disk between the fixed expansion and counter rings. Standard table sizes with 500x500 mm pallets achieve approx. 3000 to 4000 Nm holding torque at 80 to 120 Bar hydraulic pressure.

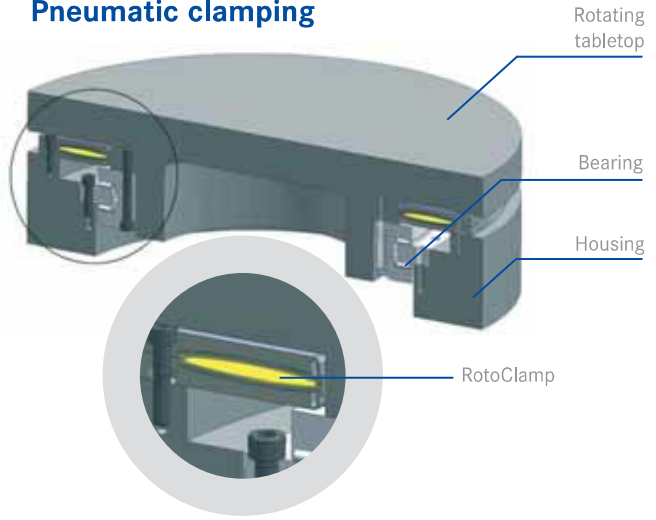
Safety No safety clamping. If there is a power loss then this axis is no longer clamped.

Reaction times Long and short times with high effort can be achieved.

Costs Precisely manufactured mechanical parts, expensive hydraulic valves, hydraulic piping incl. assembly times, assembly and matching of the mechanical parts; replaceable in part. Safety clamping can only be realised at great effort. Extra material costs of hydraulic vis-à-vis pneumatic. (hydraulic valves, flexible hydraulic lines, piping and screwed joints, relays due to higher rate of power consumption).

Cleanliness hydraulic.

Pneumatic clamping



Operating principle of the RotoClamp

Function Clamps with spring actuator. Depressurizing the inner spring diaphragm chamber and ventilating the outer spring diaphragm chamber relaxes the diaphragm and presses on the radial contact surfaces at the inner and outer diameter of the spring. The clamping element is reformed elastically in the area of the clamping surface and presses on the shaft. Adding pressurized air to the inner spring diaphragm chamber (4 or 6 Bar) and venting the outer spring diaphragm chamber bends the diaphragm and the distance between the two radial contact surfaces at the inner and outer diameter of the spring is shortened: The clamping surface lifts off from the shaft. You have the optional possibility of increasing the clamping force by extra loading of the outer spring diaphragm chamber with compressed air when clamped (4 or 6 Bar).

Safety Safety clamping by spring actuator. In case of a power loss, the axis is immediately clamped.

Reaction times Very short due to pneumatics. With quick air-vent valve and quick-acting gate valve attached directly to the clamping mechanism, you can realise extremely short clamping times.

Costs Low costs (in comparison to hydraulics), pneumatic valves and pneumatic piping, low installation costs, no cost for matching, easily replaceable, including safety clamp.

Cleanliness Very clean due to pneumatics.

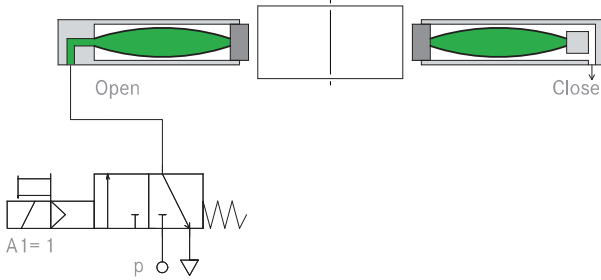
Materials Clamping-body housing hardened and tempered in fine grain mild steel, optional

- supported flange joint hardened with case-hardening steel,
- steel coated, alternative lining procedure possible.

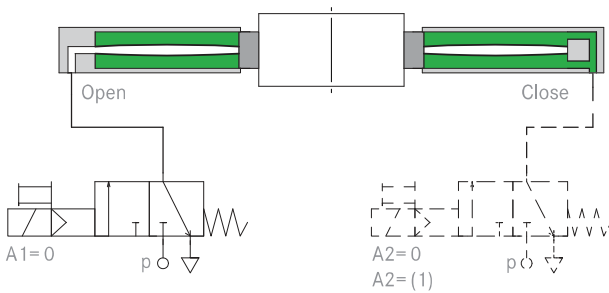
OPERATING PRINCIPLE OF THE ROTOCLAMP INSIDE

Function of the RotoClamp Inside

RotoClamp standard inner clamping
Opening the spring actuator

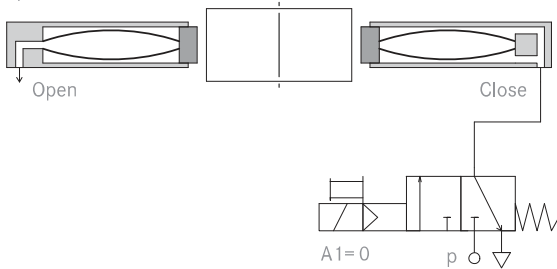


RotoClamp standard inner clamping
Clamping optional with spring actuator and secondary air

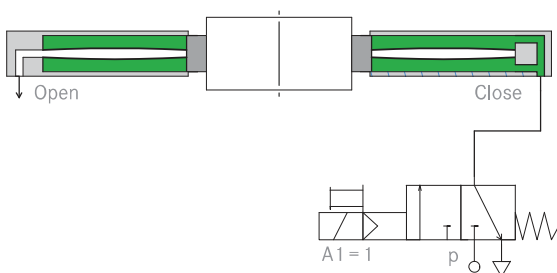


Function of the RotoClamp Inside Active

RotoClamp standard inner clamping active
opened



RotoClamp standard inner clamping active
Clamping with secondary air



Release RotoClamp Inside Adding pressurized air to the inner spring diaphragm chamber (open, 4 or 6 Bar) and venting the outer spring diaphragm chamber (close) bends the diaphragm and the distance between the two radial contact surfaces at the inner and outer diameter of the spring is shortened: The clamping element is opened in this state.

Clamping RotoClamp Inside Depressurizing the inner spring diaphragm chamber (open) and venting the outer spring diaphragm chamber (close) relaxes the diaphragm and presses on the radial contact surfaces at the inner and outer diameter of the spring. The clamping element is reformed in the area of the clamping surface. The clamping element is closed in this state.

RotoClamp Inside with secondary air You have the optional possibility of increasing the clamping force by extra loading of the outer spring diaphragm chamber (close) with compressed air (4 or 6 Bar). The clamping element is closed in this state.

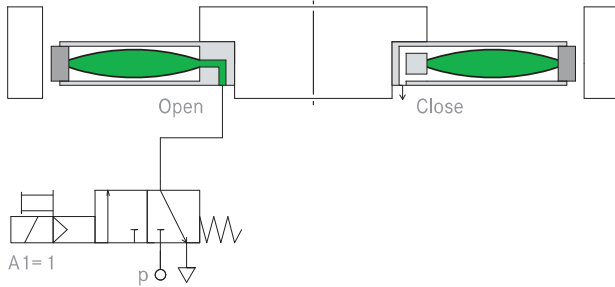
Release RotoClamp Inside The spring diaphragm is bent on assembly and the distance between the two radial contact surfaces at the inner and outer diameter of the spring is reduced. The clamping element is opened in this state.

Clamping RotoClamp Inside Depressurizing the inner spring diaphragm chamber (open) and venting the outer spring diaphragm chamber (close, 4 or 6 Bar) reforms the diaphragm and presses on the radial contact surfaces at the inner and outer diameter of the spring. The clamping element is reformed in the area of the clamping surface. The clamping element is closed in this state.

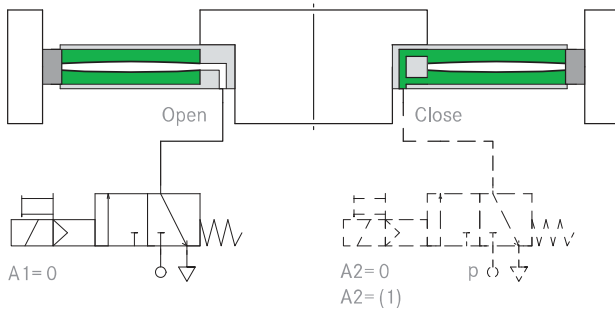
OPERATING PRINCIPLE OF THE ROTOCLAMP OUTSIDE

Function of the RotoClamp Outside

RotoClamp standard outer clamping
Opening the spring actuator



RotoClamp standard outer clamping
Clamping optional with spring actuator and secondary air



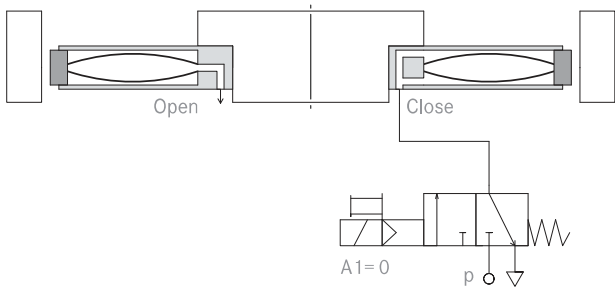
Release RotoClamp Outside Adding pressurized air to the inner spring diaphragm chamber (open, 4 or 6 Bar) and venting the outer spring diaphragm chamber (close) bends the diaphragm and the distance between the two radial contact surfaces at the inner and outer diameter of the spring is shortened. The clamping element is opened in this state.

Release (open) RotoClamp Outside Depressurizing the inner spring diaphragm chamber (open) and venting the outer spring diaphragm chamber (close) relaxes the diaphragm and presses on the radial contact surfaces at the inner and outer diameter of the spring. The clamping element is reformed in the area of the clamping surface. The clamping element is closed in this state.

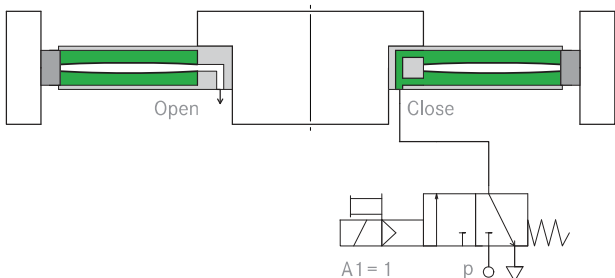
Clamping RotoClamp Outside with secondary air You have the possibility of increasing the clamping force by extra loading of the outer spring diaphragm chamber (close) with compressed air (4 or 6 Bar). The clamping element is closed in this state.

Function of the RotoClamp Outside Active

RotoClamp standard outer clamping active
opened



RotoClamp standard outer clamping active
Clamping with secondary air



Release RotoClamp Outside The spring diaphragm is bent on assembly and the distance between the two radial contact surfaces at the inner and outer diameter of the spring is reduced. The clamping element is opened in this state.

Clamping (close) RotoClamp Outside Depressurizing the inner spring diaphragm chamber (open) and venting the outer spring diaphragm chamber (close) with compressed air (4 or 6 Bar) reforms the diaphragm and presses on the radial contact surfaces at the inner and outer diameter of the spring. The clamping element is reformed in the area of the clamping surface. The clamping element is closed in this state.



Compressed air

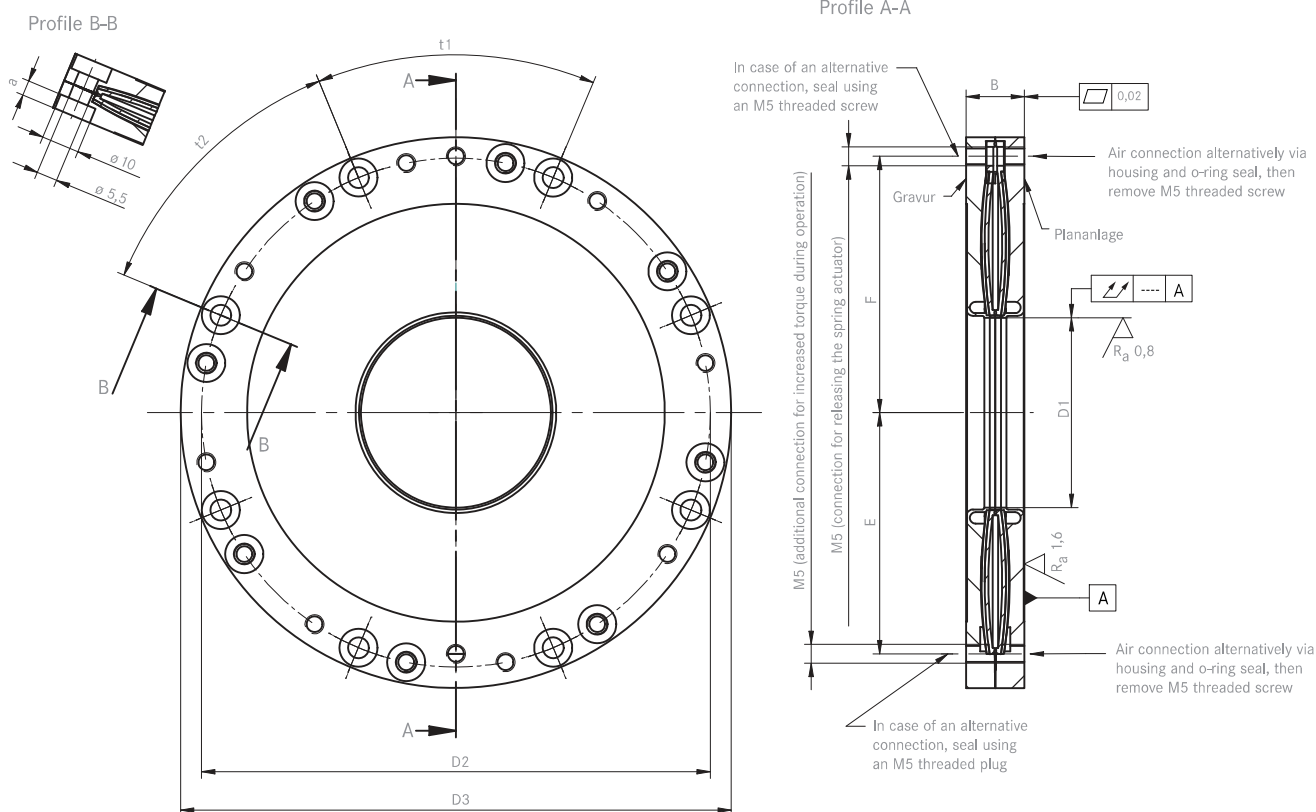
ROTOCLAMP/DISKCLAMP

TECHNICAL DATA

Technical data of the RotoClamp S

Size	D1 opened at rated pressure Pn=4/6 Bar	Required shaft diameter	D2	D3	B	E	F	n number of fixing screws M5	a	t1	t2	Elastic holding torque at 0 Bar Pn = 6 Bar	Elastic holding torque with secondary air at 6 Bar Pn = 6 Bar	Elastic holding torque at 0 Bar Pn = 4 Bar	Elastic holding torque with secondary air at 4 Bar Pn = 4 Bar	Max. mass	Air requirements per max. stroke
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Quantity	[mm]	[°]	[°]	[Nm]	[Nm]	[Nm]	[Nm]	[kg]	[mL]
Tolerance	+0,03/+0,05	-0,01/-0,025	± 0,1		+0,4												
Roundness	0,01	0,01															
Surface finish	R _a 0,8 μm	R _a 0,8 μm															
RC 50 S	50	50	134	145	15	63,5	67,5	8	4	45	45	60	108	42	76	1,7	20
RC 60 S	60	60	144	155	15	68,5	72,5	8	4	45	45	84	153	59	107	1,9	20
RC 70 S	70	70	154	165	15	73,5	77,5	12	4	30	30	114	210	80	147	2,1	20
RC 80 S	80	80	164	175	15	78,5	82,5	12	4	30	30	150	270	105	189	2,3	20
RC 90 S	90	90	174	185	15	83,5	87,5	12	4	30	30	189	342	132	239	2,5	20

This technical data applies to the RotoClamp S Standard. Data for the RotoClamp S Active is available on request.

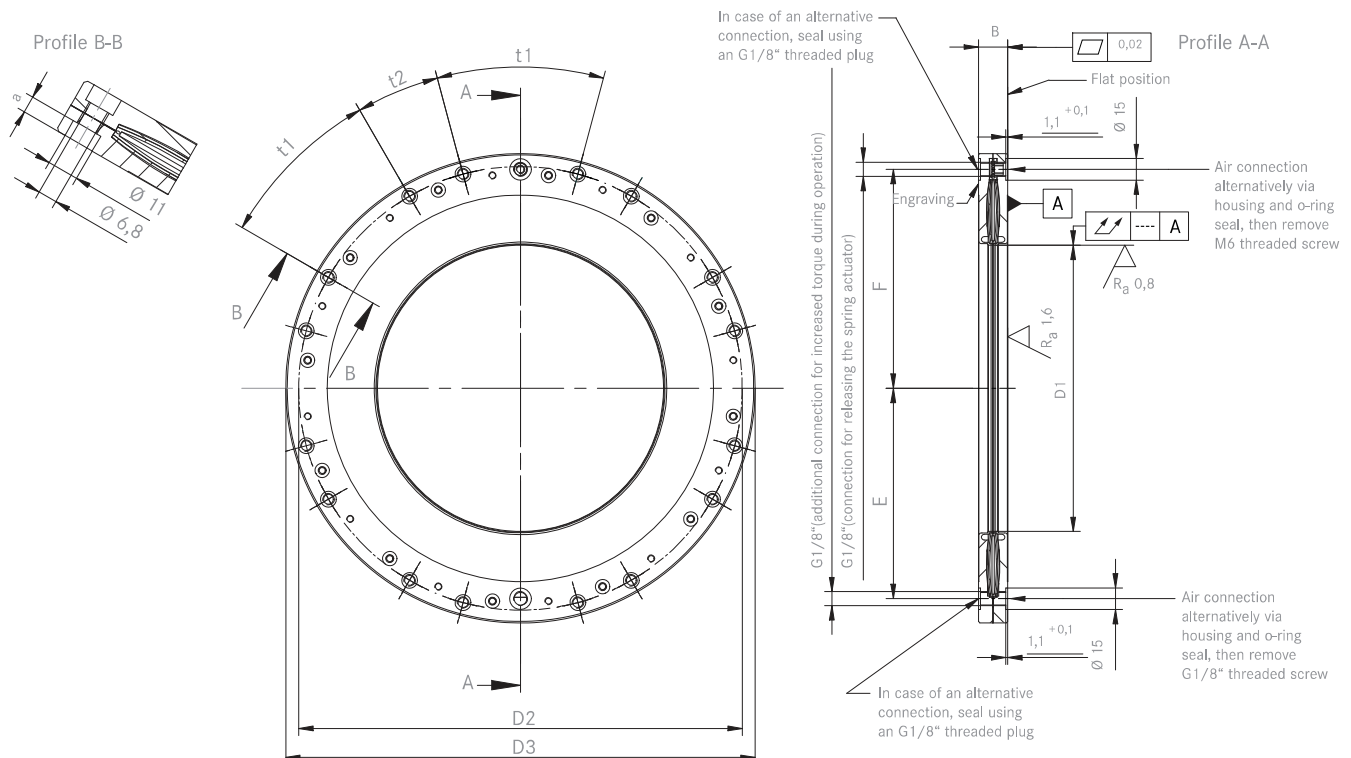


TECHNICAL DATA

Technical data of the RotoClamp N

Size	D1 opened at rated pressure Pn = 4 / 6 Bar	Required shaft diameter	D2	D3	B	E	F	n number of fixing screws M6	a	t1	t2	Elastic holding torque at 0 Bar Pn = 6 Bar	Elastic holding torque with secondary air at 6 Bar Pn = 6 Bar	Elastic holding torque at 0 Bar Pn = 4 Bar	Elastic holding torque with secondary air at 4 Bar Pn = 4 Bar	Max. mass	Air requirements per max. stroke
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Quantity	[mm]	[°]	[°]	[Nm]	[Nm]	[Nm]	[Nm]	[kg]	[mL]
Tolerance	+0,04/+0,06	-0,01/-0,025	± 0,1		+0,4												
Roundness	0,01	0,01															
Surface finish	R _a 0,8 μm	R _a 0,8 μm															
RC 100 N	100	100	210	228	16	103	103	12	4	40	20	240	420	168	294	4,1	60
RC 120 N	120	120	230	248	16	113	113	12	4	40	20	336	600	235	420	4,6	60
RC 140 N	140	140	250	268	16	123	123	12	4	40	20	456	840	319	588	5,1	60
RC 160 N	160	160	270	288	16	133	133	12	4	40	20	600	1080	420	756	5,6	60
RC 180 N	180	180	290	308	20	137	143	16	6	30	15	750	1380	525	966	7,7	90
Tolerance	+0,05/+0,07	-0,01/-0,03	± 0,2		+0,4												
Roundness	0,015	0,015															
RC 200 N	200	200	310	328	20	147	153	16	6	30	15	930	1680	651	1176	8,3	90
RC 220 N	220	220	330	348	20	157	163	16	6	30	15	1110	2040	777	1428	8,9	90
RC 240 N	240	240	350	368	20	167	173	24	6	20	10	1350	2400	945	1680	9,5	90
RC 260 N	260	260	370	388	22	177	183	24	6	20	10	1560	2820	1092	1974	11,2	120
RC 280 N	280	280	390	408	22	187	193	24	6	20	10	1800	3240	1260	2268	11,9	120
RC 300 N	300	300	410	428	22	197	203	24	6	20	10	2100	3720	1470	2604	12,6	120
RC 320 N	320	320	430	448	22	207	213	24	6	20	10	2340	4200	1638	2940	13,3	120
RC 340 N	340	340	450	468	22	217	223	24	6	20	10	2580	4680	1806	3276	14,0	120

This technical data applies to the RotoClamp N Standard. Data for the RotoClamp N Active is available on request.



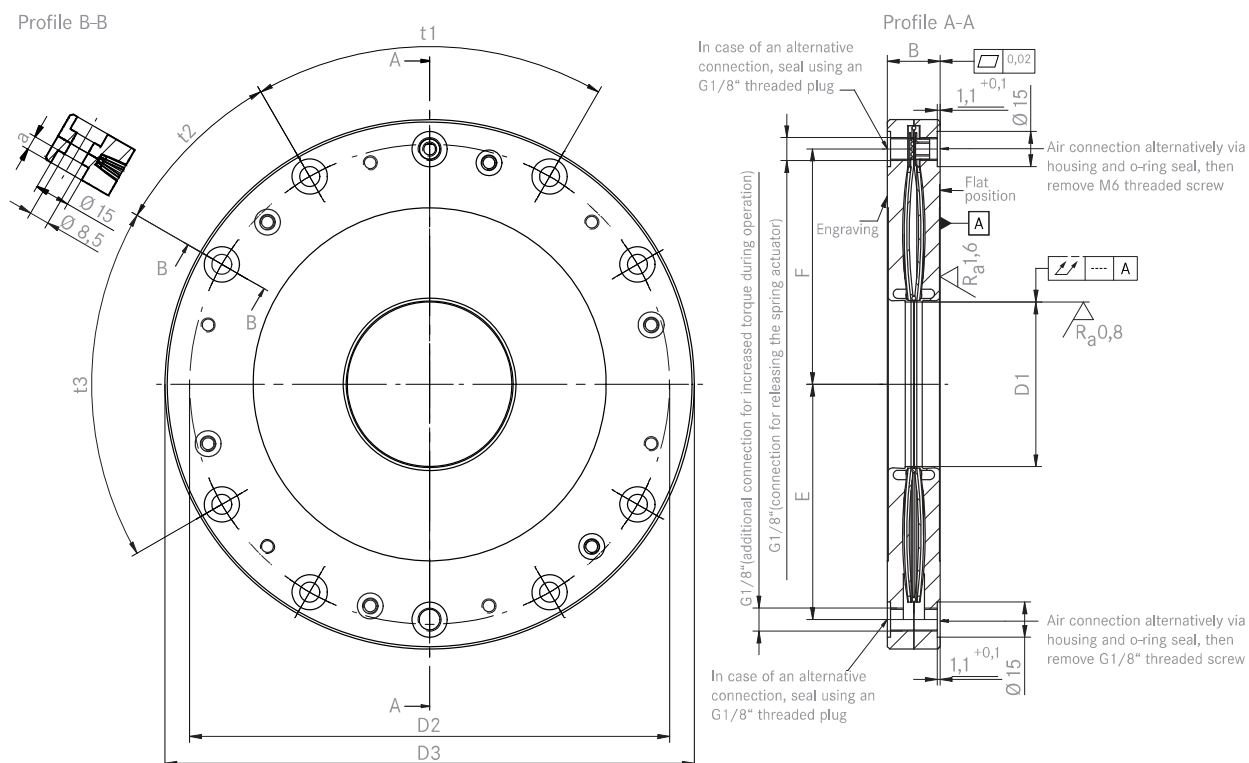
ROTOCLAMP/DISKCLAMP

TECHNICAL DATA

Technical data of the RotoClamp L

Size	D1 opened at rated pressure Pn = 4 Bar	Required shaft diameter	D2	D3	B	E	F	n number of fixing screws M8	a	t1	t2	t3	Elastic holding torque at 0 Bar Pn = 4 Bar	Elastic holding torque with secondary air at 4 Bar Pn = 4 Bar	Max. mass	Air requirements per max. stroke.
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Quantity	[mm]	[°]	[°]	[°]	[Nm]	[Nm]	[kg]	[mL]
Tolerance	+0,04/+0,06	-0,01/-0,025	± 0,1		+0,4											
Roundness	0,01	0,01														
Surface finish	R _a 0,8 μm	R _a 0,8 μm														
RC 70 L	70	70	204	225	22	100	100	8	6	60	30	60	114	210	6,2	50
RC 140 L	140	140	274	295	22	135	135	16	6	30	15	30	456	840	9,1	100
RC 180 L	180	180	314	335	22	155	155	22	6	30	15	15	750	1380	10,8	100
Tolerance	+0,05/+0,07	-0,01/-0,03	± 0,2		+0,4											
Roundness	0,015	0,015														
RC 200 L	200	200	334	355	22	165	165	22	6	30	15	15	930	1680	11,7	100
RC 240 L	240	240	374	395	22	185	185	34	6	20	10	10	1350	2400	13,3	150
RC 280 L	280	280	414	435	22	205	205	34	6	20	10	10	1800	3240	14,9	150
RC 320 L	320	320	454	475	22	225	225	34	6	20	10	10	2340	4200	16,7	150
RC 340 L	340	340	474	495	22	235	235	34	6	20	10	10	2580	4680	17,5	150

This technical data applies to the RotoClamp L Standard. Data for the RotoClamp L Active is available on request.



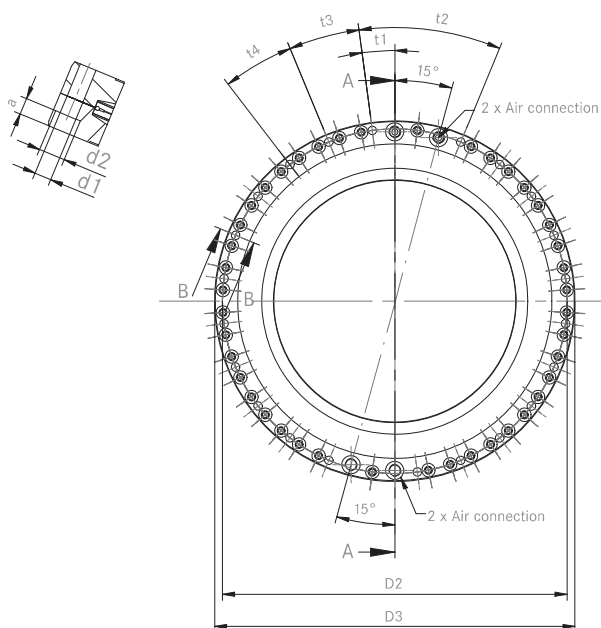
TECHNICAL DATA

Technical data of the RotoClamp Y

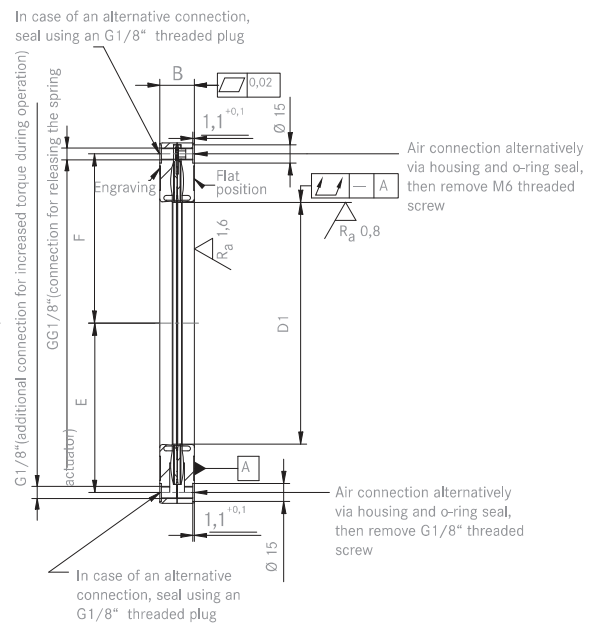
Size	D1 opened at rated pressure Pn = 4 / 6 Bar	Required shaft diameter	D2	D3	B	E	F	n number of fixing screws	a	d1	d2	t1	t2	t3	t4	Elastic holding torque at 0 Bar Pn = 6 Bar	Elastic holding torque with secondary air at 6 Bar Pn = 6 Bar	Elastic holding torque at 0 Bar Pn = 4 Bar	Elastic holding torque with secondary air at 4 Bar Pn = 4 Bar	Max. mass	Air requirements per max. stroke
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Quantity	[mm]	[mm]	[mm]	[°]	[°]	[°]	[°]	[Nm]	[Nm]	[Nm]	[Nm]	[kg]	[mL]
Tolerance	+0,05/+0,07	-0,01/-0,03	± 0,2		+0,4																
Roundness	0,015	0,015																			
Surface finish	R _a 0,8 μm	R _a 0,8 μm																			
RC 200 Y	200	200	285	298	28	140	140	22xM6	6,8	7	11	7,5	30	15	15	600	1000	420	700	8,5	100
RC 260 Y	260	260	365	383	30	183	183	24xM8	9,0	9	15	5	10	20	10	1600	2900	1120	2030	14,5	100
RC 325 Y	325	325	430	448	30	215	215	24xM8	9,0	9	15	5	10	20	10	2300	4100	1610	2870	17,5	120
Tolerance	+0,05/+0,07	-0,01/-0,03	± 0,2		+0,4																
Roundness	0,020	0,015																			
RC 395 Y	395	395	505	523	36	252,5	252,5	48xM8	9	9	15	3,75	7,5	7,5	7,5	3300	6100	2310	4270	26	160
Tolerance	+0,06/+0,08	-0,01/-0,03	± 0,2		+0,4																
Roundness	0,020	0,015																			
RC 460 Y	460	460	580	598	36	290	290	48xM8	9	9	15	3,75	7,5	7,5	7,5	4600	8400	3220	5880	32	240

This technical data applies to the RotoClamp Y Standard. Data for the RotoClamp Y Active is available on request.

Profile B-B



Profile A-A



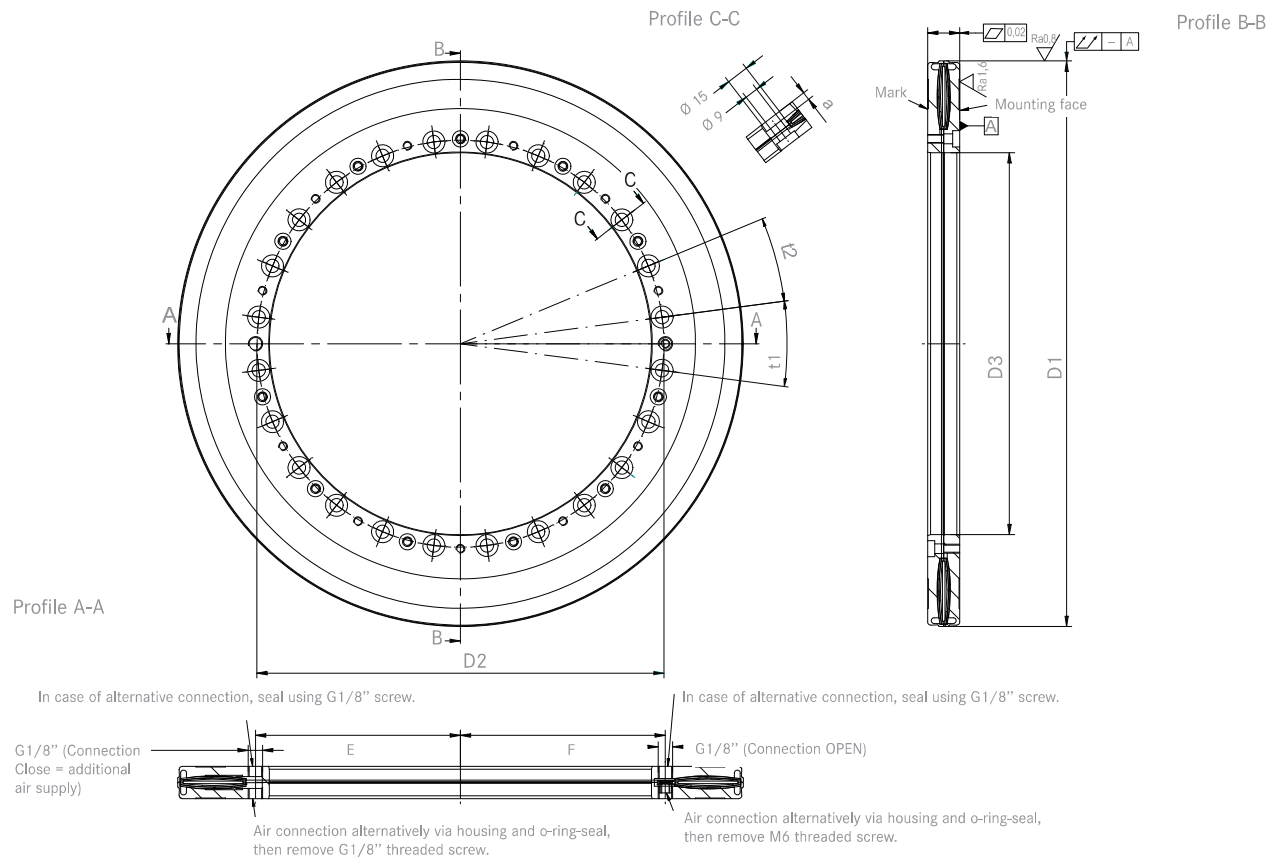
TECHNICAL DATA

Technical Data RotoClamp Outside N

Size	D1 opened at rated pressure Pn = 4/6 Bar	Required shaft diameter	D2	D3	B	E	F	n number of fixing screws	a	t1	t2	Elastic holding torque at 0 Bar Pn = 6 Bar	Elastic holding torque with secondary air at 6 Bar Pn = 6 Bar	Elastic holding torque at 0 Bar Pn = 4 Bar	Elastic holding torque with secondary air at 4 Bar Pn = 4 Bar	Mase max.	Air require- ments per max stroke
Unit	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	Quantity	[mm]	[°]	[°]	[Nm]	[Nm]	[Nm]	[Nm]	[kg]	[mL]
Tolerance	-0,045/-0,065	+0,01/+0,03	± 0,1		+0,4												
Round- ness	0,015	0,015															
Surface- finish	R _a 0,8 μm	R _a 0,8 μm															
RCO 195 N*	195	195	87	70	22	44,5	44,5	10 x M8	5,5	36	36	456	819	328	573	3,1	60
RCO 255 N*	255	255	147	130	22	74,5	74,5	16 x M8	5,5	22,5	22,5	1080	1944	756	1361	4,5	80
RCO 315 N*	315	315	207	190	22	104,5	104,5	18 x M8	5,5	20	20	1887	3468	1321	2428	6,1	100
RCO 385 N	385	385	277	260	22	139,5	139,5	24 x M8	5,5	15	15	3100	5500	2100	3800	7	120

This technical data applies to the RotoClamp N Standard. Data for the RotoClamp N Active is available on request.

*Preliminary data



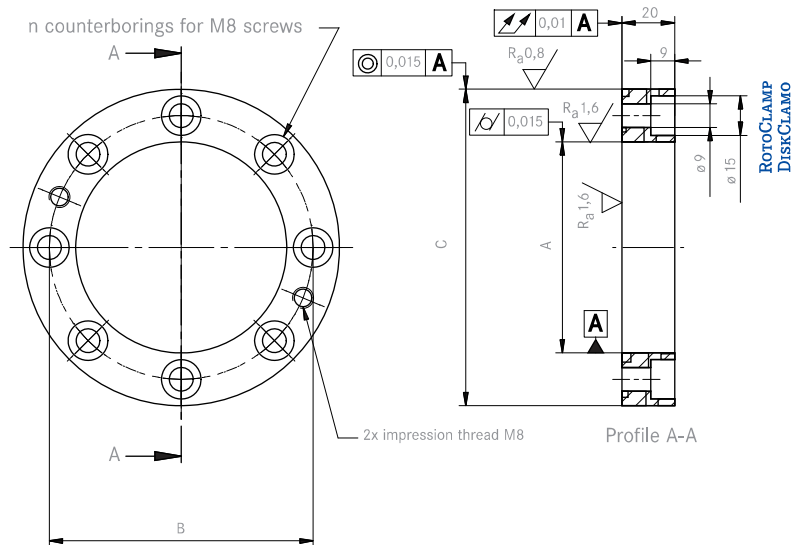
OPTIONS/INSTALLATION

RotoClamp with optional shaft flange

RotoClamp can also be delivered as a complete solution with the shaft flange manufactured to your specifications using various materials. The optional clamping flange is available

in the following qualities: hardened with case-hardened steel
or plasma-coated steel.

Size	Ø A	Ø B	Ø C	n counter-sinkings
Tolerance	H7	±0,1 mm	- 0,010 - 0,030	
100	60	80	120	8
120	80	100	120	8
140	100	120	140	8
160	110	136	160	12
180	130	156	180	12
200	150	176	200	12
220	170	196	220	12
240	190	216	240	12
260	210	236	260	12
280	230	256	280	12
300	250	276	300	12
320	270	296	320	12



Installation and assembly

General

- To transfer the maximum clamping forces, the connection to the machine structure should be as rigid as possible.
- The characteristics indicated for the clamping elements can only be achieved by correct construction, manufacturing, assembly and use of the system.

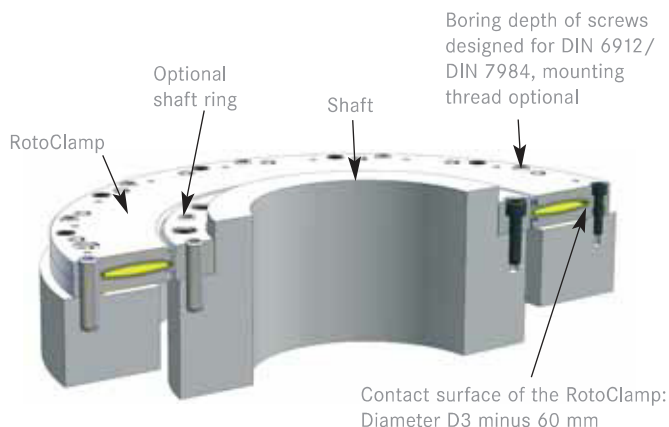
- After the RotoClamp is centred in the intended position, the fixing screws are tightened cross-wise in several phases to the defined torque.
- After fixing, the clamping mechanism is opened and a check is made whether the shaft can be turned freely. Only this ensures correct function.

Assembly instructions of the shaft flange

- The seating at the shaft should be a g6-fit. The shaft flange is placed on the flat machined side, screwed down lightly and then aligned for smooth running.
- The required tightening torque for the tightening screws M8/12,9 is 44 Nm in order to transfer the maximum torque.

Assembly instructions of the RotoClamp

- Compressed air is applied to the RotoClamp and it is opened. Clamping can then be initiated via the shaft. The RotoClamp is then placed on the flat matching side and screwed down with a reduced torque.
- The compressed air is then reduced to 0 Bar, thereby activating the clamping. This procedure centres the clamping mechanism relative to the shaft. The RotoClamp must be free at the outer diameter (>1 mm) to ensure safe function.

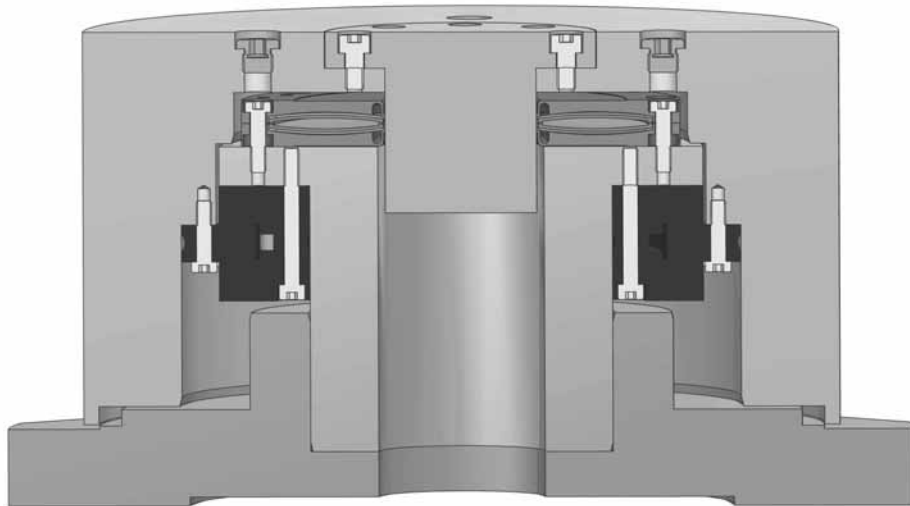


Make sure that there is a rigid connection and correct attachment to transmit the forces!

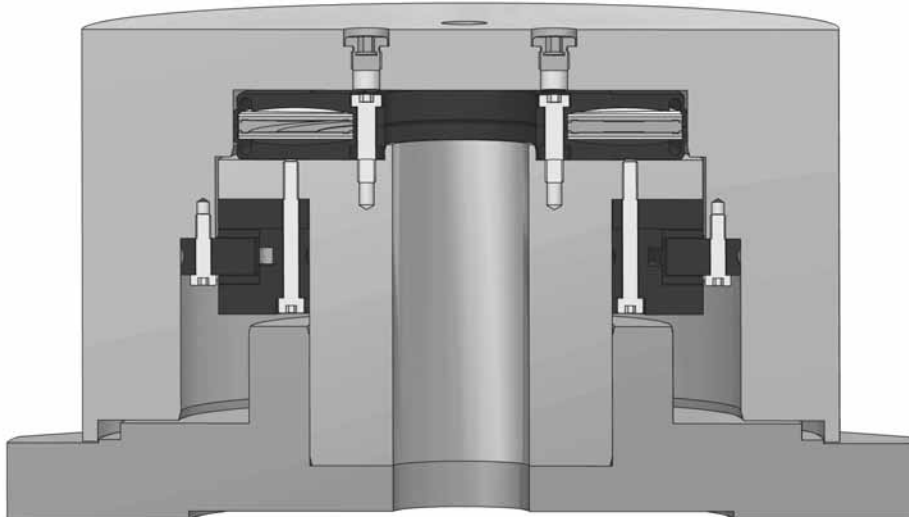
DETAILS OF CONSTRUCTION

Design recommendations

- The accuracy of the clamping surface is established by matching the precision ground inside diameter to the flat machined mounting surface of the RotoClamp. The total running tolerance of the clamping surface to the defined flat matching surface is smaller than 0.02 mm.
- The contact width of the clamping surface is between 2.5 and 4 mm, depending on the gap width. In this area, compressive stresses up to max. 180 N/mm² arise at the clamping diameter when using the secondary air function.
- Transferable torque (example): When using 12,9 M8 screws and at a prestressing force of 30700 N for each screw and a coefficient of friction of $\mu=0.1$ and a radius of 100 mm, a transferable torque of 307 Nm is achieved for each screw.
- The roundness and radial eccentricity of the shaft in assembled state should be <0.02 mm.
- The total running tolerance of the plane surface to the shaft for attaching the clamping mechanism should be <0.02 mm.
- The flat attachment should not be wider than D3-60 mm.
- The RotoClamp must be free at the outer diameter (RotoClamp Inside) or at the inside diameter (RotoClamp Outside) to be able to centre itself.



View: RotoClamp Inside in mounting position (suggestion)



View: RotoClamp Outside in mounting position (suggestion)

ROTOCLAMP/DISKCLAMP

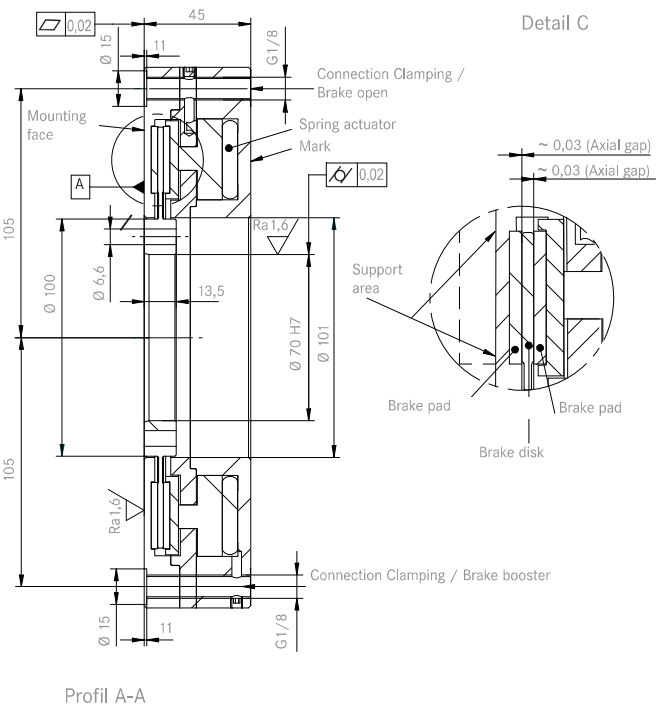
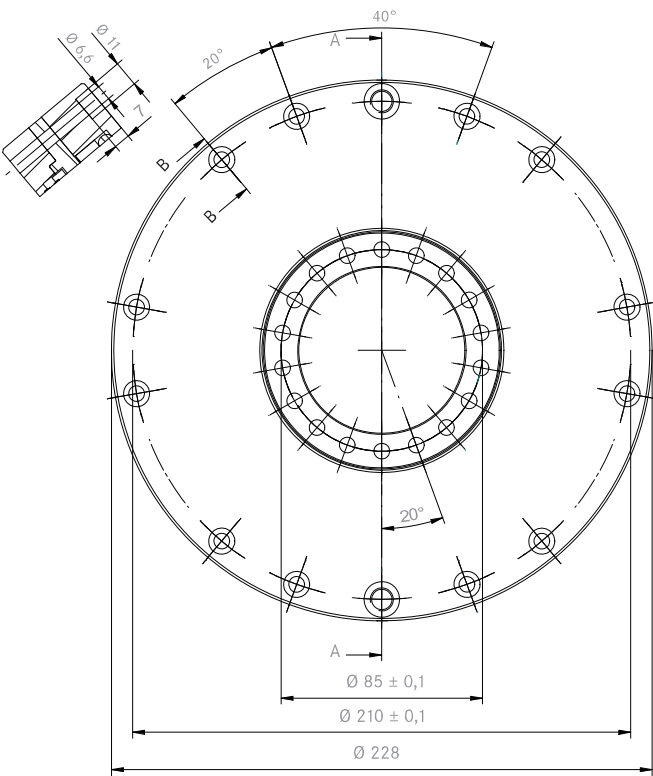
TECHNICAL DATA

DiskClamp - Security clamping system with **EMERGENCY BRAKE**

Technical Data DiskClamp

Size	Brake clamping torque at 0 Bar Pn = 6 Bar	Brake clamping torque with booster at 6 Bar Pn = 6 Bar	Brake clamping torque at 0 Bar Pn = 4 Bar	Brake clamping torque with booster at 4 Bar Pn = 4 Bar	Mass Brake disk	Mass max.	Air requirements per max stroke
Unit	[Nm]	[Nm]	[Nm]	[Nm]	[kg]	[kg]	[mL]
DC 100	240	420	160	290	0,65	10	60

Profile B-B



REQUEST FORM

Please send by fax to +49 6182 773-35

Company name: _____

Address: _____

Country/Zip/Location: _____

Contact: _____

Area/Department: _____

Telephone: _____

DID: _____

Fax: _____

Direct: _____

E-Mail: _____

Internet: _____

RotoClamp systems can be adjusted for various applications. The following criteria decide on the configuration of the system. Please enter the information as completely and detailed as possible.

Model (please check):



☐ RotoClamp Outside

☐ S ☐ N



☐ RotoClamp Inside (A = Aktiv)

☐ S ☐ N ☐ L ☐ Y
☐ SA ☐ NA ☐ LA ☐ YA



☐ DiskClamp

Type designation according to the table: _____

Standard bore according to drawing: _____

Clamping cycles: _____ per _____

☐ Yes

☐ No

special requirement: _____

In case of deviation, please enclose the drawing for the application or mail to info@hema-schutz.de.

Clamping torque: _____ Nm

Optional shaft flange: _____

Planned connection pressure: _____

Required quantity: _____

☐ 4 Bar

☐ 6 Bar

Date of delivery: _____

Dimensions:

☐ Please call back

☐ Please visit

Outer diameter D3: _____ mm

Other: _____

Inside diameter D1: _____ mm

Fixing diameter D2: _____ mm

Overall height: _____

You can also download this form at:

www.hema-schutz.de

ROTOCLAMP/DISKCLAMP

