We introduce ourselves...

Pneumatic

Part Turn Actuators

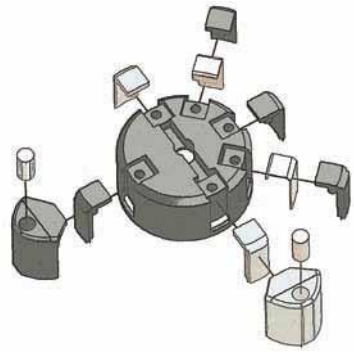
- **4th Generation pneumatic part turn actuators**

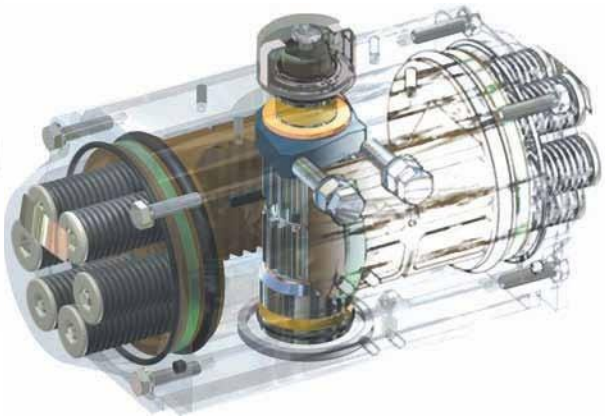
Innovations for the future with new and intelligent highlights!

The development and production of the pneumatic actuators is done in accordance with the practicable standards, for example the ISO 5211, DIN 3337, VDI/VDE 3845 or the NF E29-409 under attention of the ISO 9001.

Our team in the sales department, the project planning and in the assemblage assures to you a perfect support and a high quality standard. To garantee the daily deliveries we maintain the worldwide biggest stock with Air Torque part turn actuators.

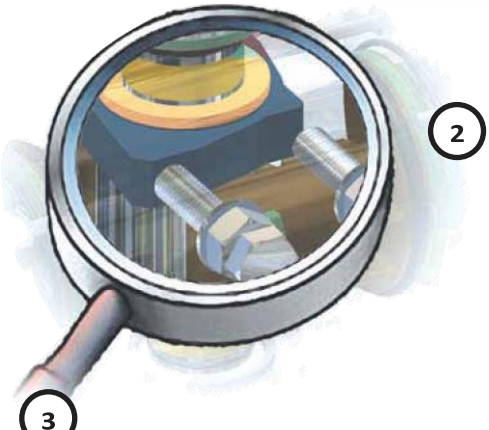
Here we provide beside the technical informations a large download area with documentation and drawings.





Interresting news and a lot of technical developments combine reliabled now with the requirements of the future and fulfil the newest completions of the ISO 5211 yet!

1



2

3

Body - The Aluminium body with the appealing 'New Edge Design' is inside and outside complete coated with ALODUR.

Advantages of the ALODUR coating:
extremely abrasion resistant, low surface roughness, optimal resistance

External stroke adjustment - a great saving of time is achieved, when mounting the actuator on the valve, through the service

friendly adjustment of both end positions with the precise cam system. The rotation angle is easily changeable with a special cam, f.e. for 0°-15° and 75°-90°. Safety for emergency cases is possible through blocking of the actuator. This new feature can be used by simply changing the screw into a longer one.
All adjustments of the end positions are possible service friendly without disassembling.

Multifunction indicator - the position of the multifunction indicator is quick adapted for a parallel or 45° position of the square as well as for
along or across to the pipe mounted actuator positions.
The direct mounting - through exchange of the yellow inserts the multifunction indicator is suitable as cam for the direct mounting (mechanic, inductive).

4

The connections - ISO 5211, DIN 3337 (F03-F25), VDI/VDE 3845 (Size 0 to 4) ISO 1 (CNOMO) and NAMUR for flexible usability and exchangeability.

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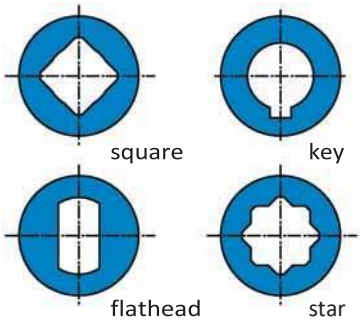
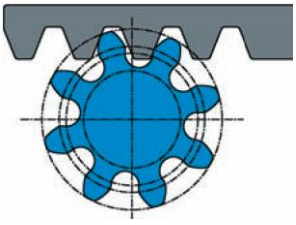
The driveshaft - square - flathead - key - star
A more flexible construction is obtained through the possibility of free adjustment of the driveshaft in 45°-steps (square on the bottom). With a rotation of the drive shaft the requested position can be realized. For correct position indication the plug of the indicator (drive shaft top) is designed as an octagon, so the position indicator also can be mounted in 45°-steps.

Optional a flathead, key connection or a star is available (for the star the lower usable torque is to consider).





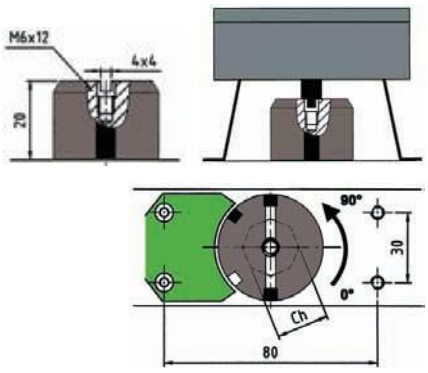
Technical details
The tooth profile, and so the way of force, for the used rack and pinion principle was optimized through the involute gearing.

Additional it is possible to adjust the torque through the reliable spring cartridges, made with high quality spring steel, according to the requirements.

The new multifunction indicator for 4th Generation actuators

(2. Line).

The multifunction indicator
The new indicator is suitable for 45° or 90° position (s. a.). A visual indication is realized through coloured inserts (white) in the (red) indicator. The inserts are variable to fit.
The indicator has a VDI/VDE-interface. So mostly every standard attachement can be mounted without problems.

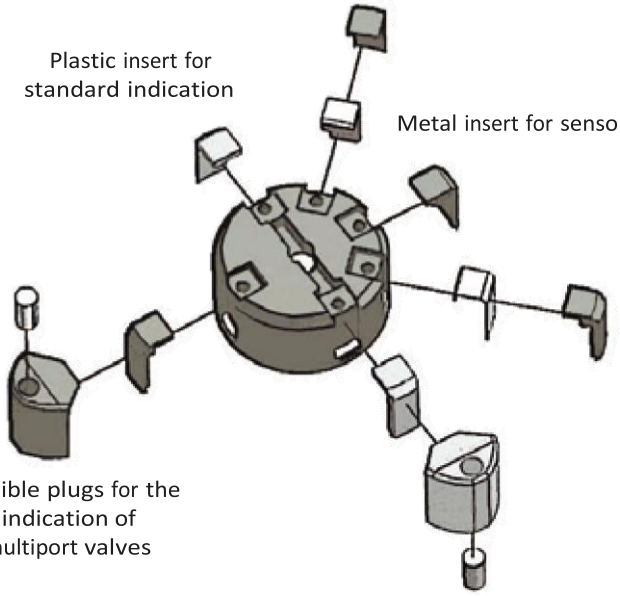


The direct mounting
Through exchange of the standard inserts with metal inserts the multifunction indicator can be quick and easy changed for direct mounting.

With this new Multifunctionindicator nearly the most of the possibilities with common switches are easily and variable to mount. And all this with the standard cams !

Plastic insert for standard indication

Metal insert for sensors



possible plugs for the indication of multiport valves

Example for mechanical or IFM sensors Size **DR/SC00015** to**DR/SC00150**

Example for proximity switches (P+F, TURCK etc...)

Example for multiport valve

Plastic insert for indication mechanical switches, variabel upgradeable with a metal pin for sensors

Note: Indicators for the actuator sizes DR/SC00220 to DR/SC05000 Ø85 / Ø115

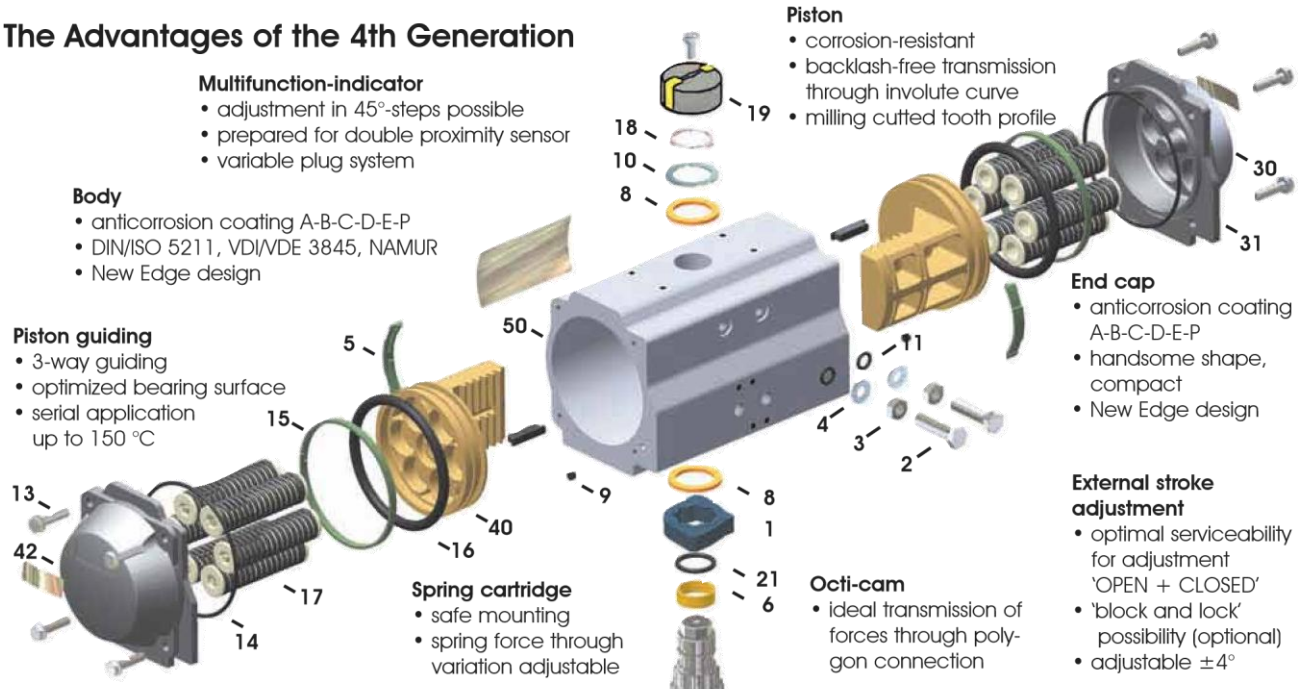
The 4th Generation

Advantages

DR/SC00015-05000

FELLBACH®

The Advantages of the 4th Generation



Type	Part and Protection		suitable for
	Body	End Caps	
A	ALODUR	Epoxy Coated	general service
B	ALODUR + PTFE - coating	chromatized + Polyester coated	acid/basic solutions in low concentration
C	ENP Polyester coated	chromatized + Polyester coated	caustic soda in low concentration
D	ALODUR + PTFE - coating	chromatized + PTFE-coated	aggressive environ. acid/basic solutions
E	ALODUR + PTFE - coating	chromatized + PTFE-coated	acid/basic solutions, seawater
P	ALODUR	Resin impreg. + Hard anodized	Processindustry, solvent

All types: piston anodized, E-type -> drive shaft stainless steel
DR/SC5000 deliverable in typ A or P only.

Technic DR/DL
4th Generation
DR/DL00015-05000

The principle of the double acting actuator

If the port '2' is under pressure and port '4' evacuated, the both pistons are moving into the endpositions and a turning of the drive shaft is the result (a turning of the drive shaft in its opposite is possible through a turned mounting of the pistons -> type DL).

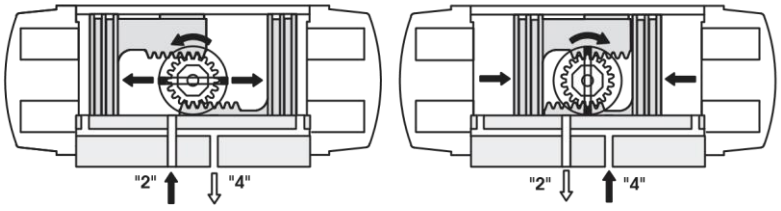


Fig. DR02: Top view and principle of a double acting actuator under pressure

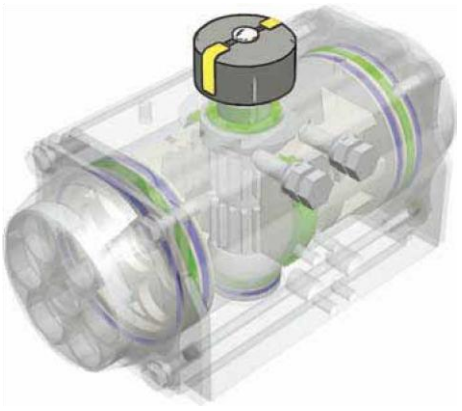
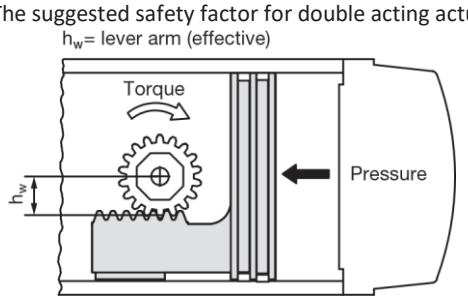


Fig. DR01:
Principle of a doubleacting actuator

If the port '4' is under pressure and the port '2' evacuated, the pistons are moving into the middle position. This also has as result a turning of the drive shaft (a turning of the drive shaft in its opposite is possible through a turned mounting of the pistons).

With rack and pinion construction the output torque of an actuator is obtained by multiplying the piston force (given by air supply pressure) by the pitch shaft radius (lever arm) as shown in fig. DR03 less the force lost for friction (efficiency). Because of this concept, the output torque is linear as shown in the diagram DR04 in both clockwise and counterclockwise rotation.
The suggested safety factor for double acting actuators in normal working conditions is 15-20%.



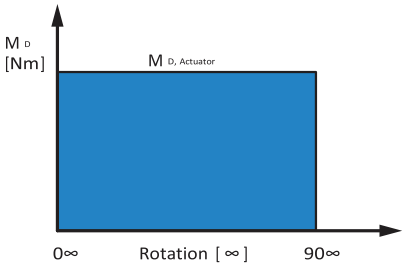


Fig. DR03: Top view of a double acting actuator

Fig. DR04: Principle of the torque under pressure (double acting)

Sizing example for double-acting actuator (data see datasheet):

Published butterfly valve torque = 40 Nm
Safety factor = 40 Nm + 20 % = 48 Nm
Air supply pressure available = 5 bar
The double acting DR Series actuator that produces a minimum of 48 Nm at 5 bar is the DR60.

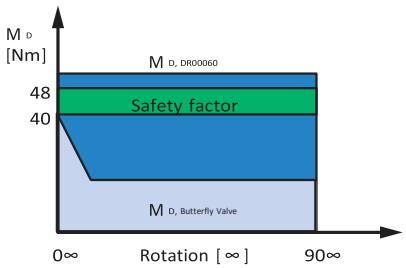


Fig. DR05:
Principle of the sizing a double-acting actuator

Technical Data

Specification/Torque DR/SC00015-05000

conditions of usage

DR/SC05000 only available in protection A or P

air supply	temperature range according to design	max. press.	turning range ±4° adjustable
filtered, lubricated or dry air, non corrosive media, Dp -20°C (Dew Point) (Dp min. 10°C < T_{area}), particle size < 30 µm	standard -20°C bis +80°C low temperature -40°C bis +80°C high temperature -15°C bis +150°C	8 bar	90° 120°-135°-180° a.A.

DR	output torque for double acting actuators												
	2,5bar	3bar	3,5bar	4bar	4,2 bar	4,5bar	5bar	5,5bar	6bar	6,5bar	7bar	7,5bar	8bar
00010	3,0	3.6	4.2	4.8	5.1	5.4	6.1	6.7	7.3	7.9	8.5	9.1	9.7
00015	8.3	10	11.6	13.3	14	15	16.6	18.3	19.9	21.6	23.3	24.9	26.6
00030	14.7	17.6	20.5	23.5	24.6	26.4	29.3	32	35.2	38.1	41	44	46.9
00060	29.1	34.9	40.7	46.5	48.9	52.4	58.2	64	69.8	75.6	81.4	87.3	93.1
00100	45.8	54.9	64.1	73.2	76.9	82.4	91.5	101	110	120	128	138	146

00150	66.5	79.8	93.1	106	112	120	133	146	160	173	186	199	213
00220	107	129	150	172	181	193	215	236	258	279	301	322	344
00300	138	166	194	222	233	249	277	305	332	360	388	415	443
00450	217	261	304	348	365	391	435	478	522	565	609	652	696
00600	284	340	397	454	477	511	567	624	681	737	794	851	908
00900	383	459	536	613	643	689	766	**842**	919	996	1072	1149	1225
01200	532	638	745	851	893	957	1064	1170	1276	1383	1489	1595	1702
02000	893	1072	1251	1430	1501	1608	1787	1966	2144	2318	2502	2684	2859
03000	1297	1556	1815	2075	2179	2334	2594	2853	3112	3372	3631	3890	4150
05000	2252	2703	3153	3604	3784	4054	4504	4955	5405	5855	6306		
10000	4169	5003	5837	6671	7005	7505	8339	9173	10007	10841	11674		

example of layout DR900 at 5,5bar air supply -> 842Nm output torque

Technical Data

Torque

DR/SC00015-05000

Output torque for spring return

SC	F/S	2,5bar		3bar		3,5bar		4bar		4,2bar		Federm.		F/S	4,2bar		4,5bar		5bar		5,5bar		6bar		8bar		Federm.	
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
00015	2/3	**4,9**	**3,4**	6,6	5,1	8,3	6,8	9,9	8,4	10,6	9,1	4,9	3	4	**8,6**	**6,2**	9,6	7,2	11,2	8,8	12,9	10,5	14,6	12,1			7,8	5,4
	3	4,3	2,5	**5,9**	**4,1**	7,6	5,8	9,3	7,4	9,9	8,1	5,8	4	4/5	7,9	5,2	**8,9**	**6,2**	10,6	7,8	12,2	9,5	13,9	11,2			8,8	6,1
	3/4			5,3	3,1	**6,9**	**4,8**	8,6	6,5	9,2	7,1	6,8	4,7	5			8,2	5,2	**9,9**	**6,9**	11,5	8,5	13,2	10,2	20,5	17,8	9,7	6,7
	4					6,2	3,8	**7,9**	**5,5**	**8,6**	**6,2**	7,8	5,4	5/6					9,2	5,9	**10,9**	**7,6**	12,5	9,2	19,8	16,8	10,7	7,4
	4/5							7,2	4,5	7,9	5,2	8,8	6,1	6							10,2	6,6	**11,9**	**8,2**	19,2	15,9	11,7	8,1
																									18,5	**14,9**		
00030	2/3	**9,1**	**6,2**	12	9,2	15	12,1	17,9	15	19,1	16,2	8,4	6	4	**15,7**	**11,1**	17,5	12,9	20,4	15,8	23,4	18,7	26,3	21,7			13,5	9
	3	8	4,5	**10,9**	**7,5**	13,9	10,4	16,8	13,3	18	14,5	10,1	7	4/5	15	9,4	**16,4**	**11,2**	19,3	14,1	22,3	17,1	25,2	20			15,2	10
	3/4			9,8	5,8	**12,8**	**8,7**	15,7	11,6	16,9	12,8	11,8	7,8	5			15,3	9,5	**18,2**	**12,4**	21,1	15,4	24,1	18,3	36,9	31,7	16,9	11,1
	4					11,6	7	**14,6**	**10**	**15,7**	**11,1**	13,5	9	5/6					17,1	10,8	**20**	**13,7**	23	16,6	35,8	30	18,6	12
	4/5							13,5	8,3	14,6	9,4	15,2	10	6							18,9	12	**21,9**	**14,9**	34,7	28,3	20,2	13,3
																									33,6	**26,7**		
00060	2/3	**18**	**11,8**	23,8	17,6	29,7	23,4	35,5	29,9	37,8	31,6	17,3	11,1	4	**31,2**	**21,2**	34,7	24,7	40,5	30,5	46,3	36,8	52,1	42,1			27,7	17,7
	3	15,8	8,3	**21,6**	**14,1**	27,5	19,9	33,3	25,8	35,6	28,1	20,8	13,3	4/5	29	17,7	**32,5**	**21,2**	38,3	27	44,1	32,8	49,9	38,6			31,2	19,9
	3/4			19,4	10,7	**25,2**	**16,5**	31,1	22,3	33,4	24,6	24,2	15,5	5			30,2	17,7	**36,1**	**23,6**	41,9	29,4	47,7	35,2	73,2	61,9	34,6	22,1
	4					23	13	**28,8**	**18,8**	**31,2**	**21,2**	27,7	17,7	5/6					33,8	20,1	**39,7**	**25,9**	45,5	31,7	71	58,5	38,1	24,3
	4/5							26,2	15,4	29	17,7	31,2	19,9	6							37,5	22,4	**43,3**	**28,3**	68,7	55	41,5	26,5
																									66,5	**51,5**		
00100	2/3	**27,4**	**16,9**	36,6	26	45,7	35,2	54,9	44,3	58,5	48	28,9	18,3	4	**47,5**	**30,7**	53	36,2	62,2	45,3	71,3	54,5	80,5	63,6			46,2	29,3
	3	23,8	11,1	**32,9**	**20,3**	42,1	29,4	51,2	38,6	54,9	42,2	34,7	22	4/5	43,9	24,9	**49,4**	**30,4**	58,5	39,5	67,7	48,7	76,8	57,8			52	33
	3/4			29,2	14,5	**38,4**	**23,6**	47,5	32,8	51,2	36,4	40,4	25,7	5			45,7	24,6	**54,8**	**33,8**	64	42,9	73,1	52,1	113	94,5	57,8	36,7
	4					34,7	17,9	**43,9**	**27**	**47,5**	**30,7**	46,2	29,3	5/6					51,2	28	**60,3**	**37,1**	69,5	46,3	110	88,7	63,5	40,3
	4/5							40,2	21,2	43,9	24,9	52	33	6							56,7	31,4	**65,8**	**40,5**	106	82,9	69,3	44
																									102	**77,1**		
00150	2/3	**41,1**	**27,1**	54,4	40,4	67,7	53,7	81	67	86,3	72,3	39,4	25,3	4	**71,1**	**48,7**	79,1	56,6	92,4	69,9	106	83,2	119	96,5			63	40,5
	3	36,1	19,2	**49,4**	**32,5**	62,7	45,8	76	59,1	81,3	64,4	47,3	30,4	4/5	66	40,8	**74**	**48,8**	87,3	62,1	101	75,3	113,9	88,6			70,9	45,6
	3/4			44,3	24,6	**57,6**	**37,9**	70,9	51,2	76,2	56,5	55,1	35,5	5	107	62,6	69	40,9	**82,3**	**54,2**	95,6	67,5	109	80,8	167	142	78,8	50,7
	4					52,5	30	**65,8**	**43,3**	**71,1**	**48,7**	63	40,5	5/6					77,2	46,3	**90,5**	**59,6**	104	72,9	162	134	86,7	55,7
	4/5							60,8	35,5	66,1	40,8	70,9	45,6	6							85,4	51,7	**99**	**65**	157	126	94,5	60,8
																									152	**118**		
00220	2/3	**66,5**	**41,9**	87,9	63,4	109	84,9	131	106	140	115	65,5	41	4	**115**	**75,7**	128	88,6	149	110	171	132	192	153			105	65,6
	3	58,3	28,8	**79,7**	**50,3**	101	71,8	123	93,3	131	102	78,6	49,2	4/5	107	62,6	**120**	**75,5**	141	97	163	118	184	140			118	73,8
	3/4			71,5	37,2	**93**	**59**	115	80,2	123	88,8	91,7	57,4	5			111	62	**133**	**83,9**	154	105	176	127	270	226	131	82
	4					84,8	45,6	**106**	**67,1**	**115**	**75,7**	105	65,6	5/6					125	71	**146**	**92,3**	168	114	262	213	144	90,2
	4/5							98,1	54	107	62,6	118	73,8	6							138	79	**159**	**101**	254	200	157	98,4
																									245	**187**		
	2/3	**86**	**56,1**	114	83,8	141	111	169	139	180	150	82,4		4	**149**	**101**	165	117	193	145	221	173	248	201	349	295	132	84

00300	3	75,5	39,6	**103**	**67,3**	131	95	159	123	170	134	98,9	52,5	**4/5**	138	84,3	**155**	**101**	182	129	210	156	238	184	338	278	148	94.5
	3/4			93	50,8	**120**	**78,5**	148	106	159	117	115	63	**5**			144	84	**172**	**112**	200	140	227	168	328	262	165	105
	4					110	62	**138**	**89,7**	**149**	**101**	132	73,5	**5/6**					161	96	**189**	**123**	217	151			181	116
	4/5							127	73,3	138	84,3	148	84	**6**							179	107	**206**	**135**	**317**	**245**	198	126
													94,5																
00450	2/3	**135**	**88,6**	179	132	222	176	265	219	283	236	129	82.4	**4**	**233**	**159**	260	185	303	229	347	272	390	316			206	132
	3	119	63	**162**	**106**	206	150	249	193	266	211	155	99	**4/5**	217	133	**243**	**159**	287	203	330	246	374	290			232	148
	3/4			146	80	**189**	**124**	233	167	250	185	180	115	**5**			227	134	**270**	**177**	314	221	357	264	547	464	258	165
	4					173	98	**216**	**142**	**233**	**159**	206	132	**5/6**					254	151	**297**	**195**	341	238	531	438	283	181
	4/5							200	116	217	133	232	148	**6**							281	169	**324**	**213**	515	412	309	198
																									498	**386**		
00600	2/3	**171**	**118**	228	174	285	231	342	288	364	310	166	112	**4**	**297**	**211**	331	245	388	302	444	358	501	415			266	180
	3	149	84	**206**	**141**	262	198	319	255	342	277	199	135	**4/5**	275	178	**309**	**212**	365	268	422	325	479	382			299	202
	3/4			183	108	**240**	**165**	297	221	319	244	233	157	**5**			286	178	**343**	**235**	400	292	456	349	706	609	332	224
	4					218	131	**274**	**188**	**297**	**211**	266	180	**5/6**					320	202	**377**	**259**	434	315	683	575	365	247
	4/5							252	155	275	178	299	202	**6**							355	225	**411**	**282**	661	542	399	269
																									638	**509**		
00900	2/3	**225**	**146**	301	223	378	299	455	376	485	406	237	158	**4**	**390**	**264**	436	310	513	387	589	464	666	540			379	253
	3	193	99	**270**	**175**	346	252	423	329	454	359	284	190	**4/5**	359	217	**405**	**263**	481	340	558	416	634	493			426	285
	3/4			238	128	**315**	**205**	391	281	422	312	332	221	**5**			373	216	**450**	**292**	526	369	603	445	941	799	474	316
	4					283	157	**360**	**234**	**390**	**264**	379	253	**5/6**					418	245	**495**	**321**	571	398	909	752	521	348
	4/5							328	186	359	217	**426**	**285**	**6**							463	274	**540**	**351**	877	704	568	379
																									846	**657**		
01200	2/3	**319**	**217**	426	323	532	430	638	536	681	578	315	213	**4**	**553**	**390**	617	453	723	560	830	666	936	772			504	340
	3	277	154	**383**	**260**	489	367	596	473	638	515	378	255	**4/5**	511	327	**575**	**390**	681	497	787	603	894	709			567	383
	3/4			341	197	**447**	**304**	553	410	596	453	441	298	**5**			532	327	**638**	**434**	745	540	851	646	1319	1135	630	425
	4					404	241	**511**	**347**	**553**	**390**	504	340	**5/6**					596	371	**702**	**477**	809	583	1277	1072	693	468
	4/5							468	284	511	327	567	383	**6**							660	414	**766**	**520**	1234	1009	756	510
																									1192	**946**		
02000	2/3	**533**	**372**	712	551	890	730	1069	908	1141	980	521	360	**4**	**924**	**667**	1032	774	1210	953	1389	1132	1568	1310			834	577
	3	461	268	**640**	**447**	818	625	997	804	1068	876	625	433	**4/5**	852	563	**959**	**670**	1138	849	1317	1028	1495	1206			938	649
	3/4			568	343	**746**	**521**	925	700	996	771	730	505	**5**			887	566	**1066**	**745**	1245	923	1423	1102	2210	1921	1042	721
	4					674	417	**853**	**596**	**924**	**667**	834	577	**5/6**					994	640	**1173**	**819**	1351	998	2138	1817	1146	793
	4/5							781	491	852	563	938	649	**6**							1101	715	**1279**	**894**	2066	1713	1251	865
																									1994	**1608**		
03000	2/3	**751**	**496**	1011	755	1270	1015	1529	1274	1633	1378	801	546	**4**	**1306**	**897**	1461	1053	1721	1312	1980	1571	2239	1831			1281	873
	3	642	336	**902**	**595**	1161	854	1420	1114	1524	1217	961	655	**4/5**	1197	737	**1352**	**893**	1612	1152	1871	1411	2130	1671			1442	982
	3/4			793	435	**1053**	**694**	1312	954	1415	1057	1121	764	**5**			1245	732	**1504**	**992**	1763	1251	2023	1510	3168	2708	1602	1091
	4					943	534	**1202**	**793**	**1306**	**897**	1281	873	**5/6**					1395	832	**1654**	**1091**	1914	1350	3060	2548	1762	1200
	4/5							1093	633	1197	737	1442	982	**6**							1545	931	**1805**	**1190**	2951	2388	1922	1309
																									2842	**2228**		
05000	2/3	**1332**	**1014**	1783	1465	2233	1915	2684	2365	2864	2546	1238	920	**4**	**2312**	**1803**	2582	2073	3033	2524	3483	2974	3934	3424			1981	1472
	3	1149	767	**1599**	**1217**	2049	1667	2500	2118	2680	2298	1486	1104	**4/5**	2128	1555	**2398**	**1825**	2849	2276	3299	2726	3750	3177			2229	1656
	3/4			1415	969	**1865**	**1420**	2316	1870	2496	2050	1733	1288	**5**			2215	1578	**2665**	**2028**	3115	2479	3566	2929			2476	1839
	4					1682	1172	**2132**	**1623**	**2312**	**1803**	1981	1472	**5/6**					2481	1781	**2931**	**2231**	3382	2682			2724	2023
	4/5							1948	1375	2128	1555	2229	1656	**6**							2748	1983	**3198**	**2434**			2971	2207

F/S springs/side (end cap)

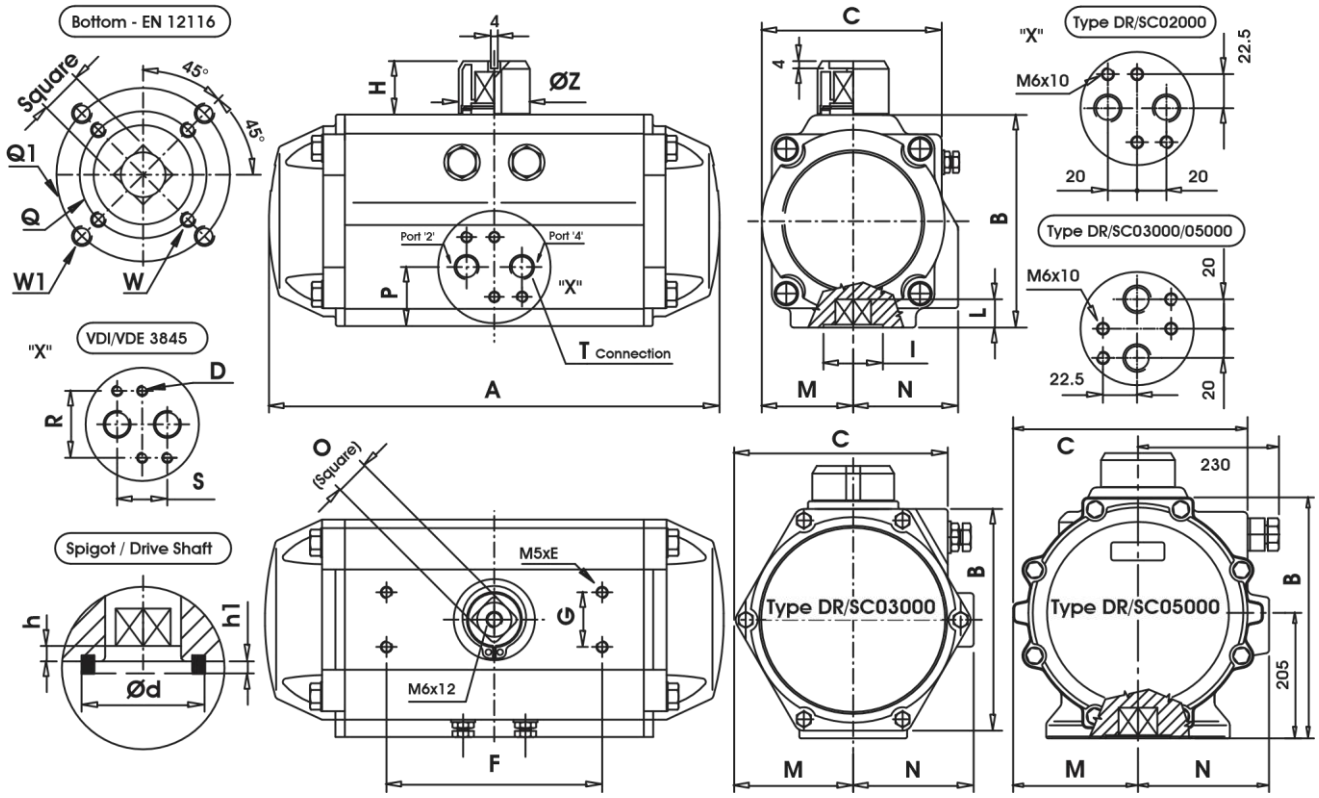
recommended size (symmetric)

SC600-5/6 at 5,5bar air supply -> 377Nm bei 0°, 259Nm bei 90°; max. spring torque 365Nm at 90° 247Nm at 0° (lower than air torque). Important for fail save closed/-opened layout

Technical Data

Dimensions

DR/SC00015-05000



Type	00015	00030	00060	00100	00150	00220	00300	00450	00600	00900	01200	02000	03000	05000	10000
	DR/SC	DR/SC	DR/SC	DR/SC	DR/SC	DR/SC	DR/SC	DR/SC	DR/SC	DR/SC	DR/SC	DR/SC	DR/SC	DR/SC	DR/SC
ISOFlange	(F03) F04	F05-07	F05-07	F05-07	F07-10	F07-10	F07-10	F10-12	F10-12	(F12) F14	(F12) F14	(F14) F16	(F14) F16	F16-25	F16-25-30
ISOFlange*	F03	F05	F05	F07	F07	F10	F10	F12	F12	F14	F14	F16	F16	F25	F30
Square	(9) 11	(11) 14	14 (17)	17	17 (22)	22	22 (27)	27	27	(27) 36	(27) 36	(36) 46	(36) 46	(46) 55	(55) 75
T-ISO228	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	3/8"	1/2"	1/2"	1/2"
A	140.5	158.5	210.5	247.5	268.5	315	345	408.5	437.5	487	543	621	728	876	856
B	69	85	102	115	127	145	157	177	196	220.5	245	298.5	330	410	525
C	59	72	84.5	97.5	111	127	136	156.5	169	190.7	213	251	298.5	383	515**
D	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M5x8	M6x10	M6x10	M6x10	M6x10
E	4	8	8	8	8	8	8	8	8	8	8	8	8	8	8
F	80	80	80	80	80	80	80	80	80	130	130	130	130	130	200
G	30	30	30	30	30	30	30	30	30	30	30	30	30	30	50
H	20	20	20	20	20	30	30	30	30	50	50	50	50	50	80
I	(25) 30	(30) 35	35	55	55	70	70	85	85	100	100	130	130	200	230
L min	12	16	16	19	19	24	24	29	29	38	38	48	48	57	77
M	29	36	42.5	49.5	56	64	69.5	80	88	99	110	131	163.5	204	-
N	41.5	47	52	56.8	67	77	82	91.5	99	105	112	131	166	214	-
O	11	11	17	17	17	27	27	27	27	36	36	36	36	36	36
P	26.5	30	30.5	32.5	37.5	42.5	45	47	52	58	62	78.5	165	185	185
Q*	(36) 42	(42) 50	**50**	50	**70**	70	70	102	102	140	140	165	165	254	298
Q1*	-	-	70	**70**	102	**102**	**102**	**125**	**125**	-	-	-	-	-	-
R	32	32	32	32	32	32	32	32	32	32	32	45	45	45	45
S	24	24	24	24	24	24	24	24	24	24	24	40	40	40	40

W*	M5	(M5) **M6**	**M6**	M6	**M8**	M8	M8	M10	M10	M16	M16	M20	M20	8xM16	8xM20
W1*	-	-	M8	**M8**	M10	**M10**	**M10**	**M12**	**M12**	-	-	-	-	-	-
ø d $_{fs}$ (A)	30	35	35	55	55	70	70	85	85	100	100	130	130	200	230
h1 $_{max}$(A)	2	3	3	3	3	3	3	3	3	4	4	5	5	5	5
h $_{mi}$Π	0.5	0.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	2	2	2.5	2.5	2.5	2.5
ø Z	40	40	40	40	40	56 (65)	56 (65)	65	65	80 (115)	(80) 115	115	115	115	115

* Protection C, D, E, P only one flange (bold printed); (A) and data in brackets -> on request;