



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.



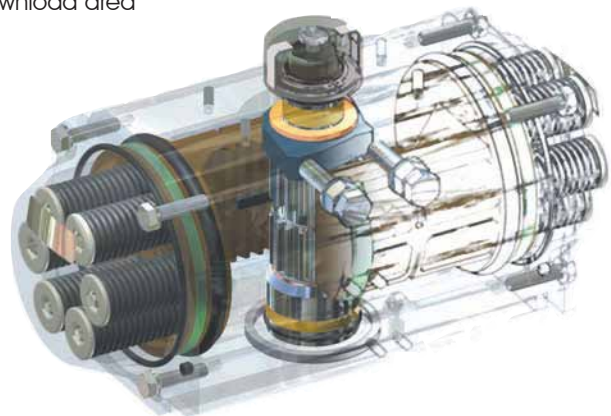
Our team in the sales department, the project planning and in the assemblage assures to you a perfect support and a high quality standard. To guarantee the daily deliveries we maintain the worldwide biggest stock with Air Torque part turn actuators.



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

Interesting 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 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

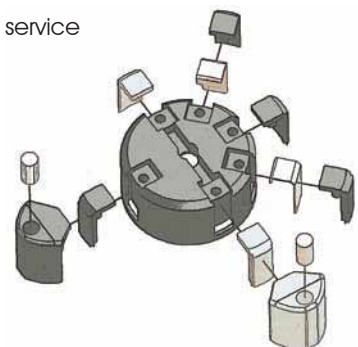
2 External stroke adjustment - a great saving of time is achieved, when mounting the actuator on the valve, through the service friendly adjustment of both end positions with the precise cam system. The rotation angle is easily changeable with a special cam, f.e. for 0°-15° and 75°-90°. Safety for emergency 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.



3 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).

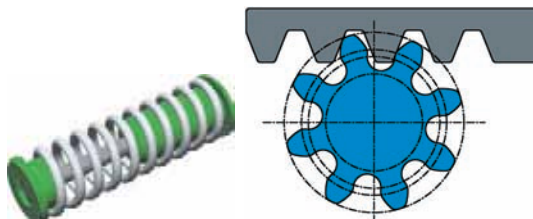
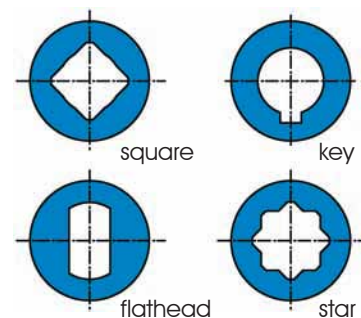
4 The connections - ISO 5211, DIN 3337 (F03-F25), VDI/VDE 3845 (Size 0 to 4) ISO 1 (CNOMO) and NAMUR for flexible usability and exchangeability.



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.

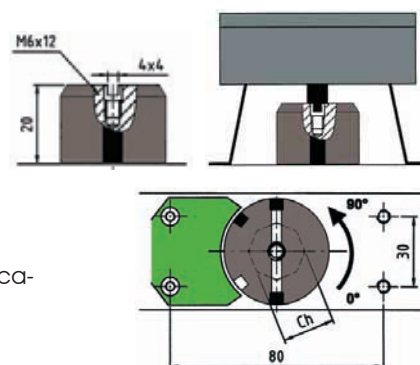
Additional it is possible to adjust the torque through the reliable spring cartridges, made with high quality spring steel, according to the requirements.

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.

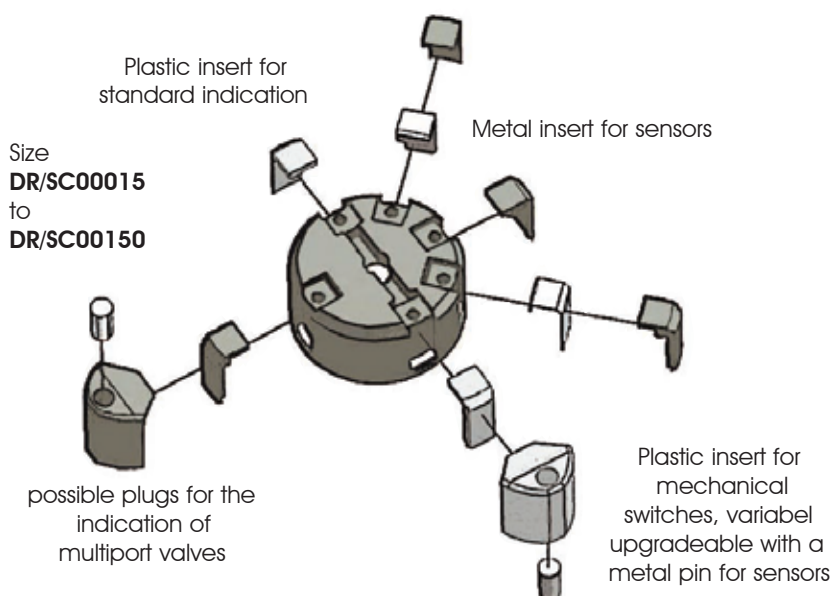
The indicator has a VDI/VDE-interface. So mostly every standard attachment can be mounted without problems.



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 !



Example for mechanical or IFM sensors



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



Example for multiport valve indication



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

The Advantages of the 4th Generation

Multifunction-indicator

- adjustment in 45°-steps possible
- prepared for double proximity sensor
- variable plug system

Body

- anticorrosion coating A-B-C-D-E-P
- DIN/ISO 5211, VDI/VDE 3845, NAMUR
- New Edge design

Piston guiding

- 3-way guiding
- optimized bearing surface
- serial application up to 150 °C

Spring cartridge

- safe mounting
- spring force through variation adjustable

Piston

- corrosion-resistant
- backlash-free transmission through involute curve
- milling cutted tooth profile

End cap

- anticorrosion coating A-B-C-D-E-P
- handsome shape, compact
- New Edge design

External stroke adjustment

- optimal serviceability for adjustment 'OPEN + CLOSED'
- 'block and lock' possibility (optional)
- adjustable $\pm 4^\circ$

Octi-cam

- ideal transmission of forces through polygon connection

Drive shaft

- high efficiency through involute gearing
- optimized bearing
- antiblowout

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.

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).

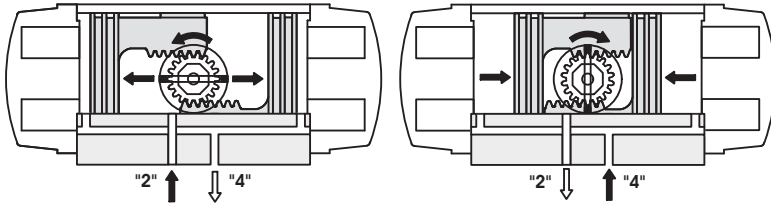


Fig. DR02: Top view and principle of a double acting actuator under pressure

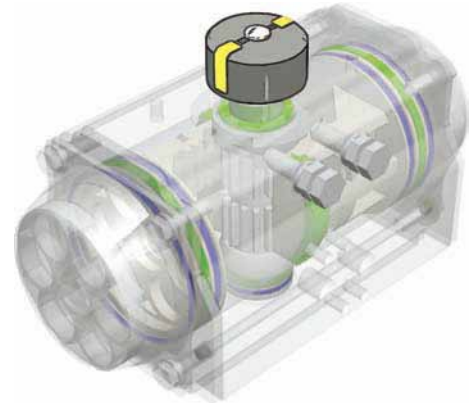


Fig. DR01:
Principle of a doubleacting actuator

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%.

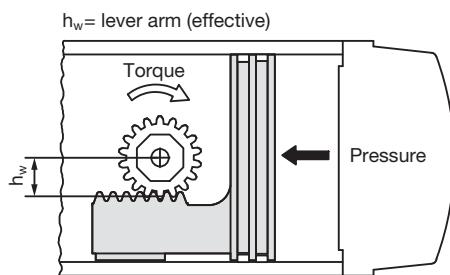


Fig. DR03: Top view of a double acting actuator under pressure

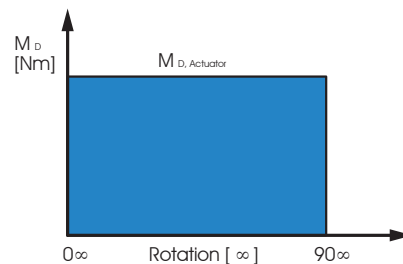


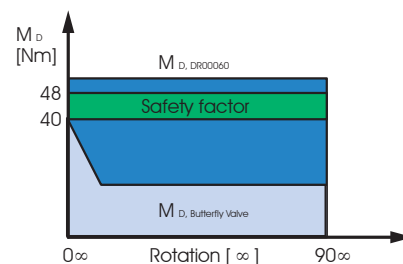
Fig. DR04: Principle of the torque (double acting)

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



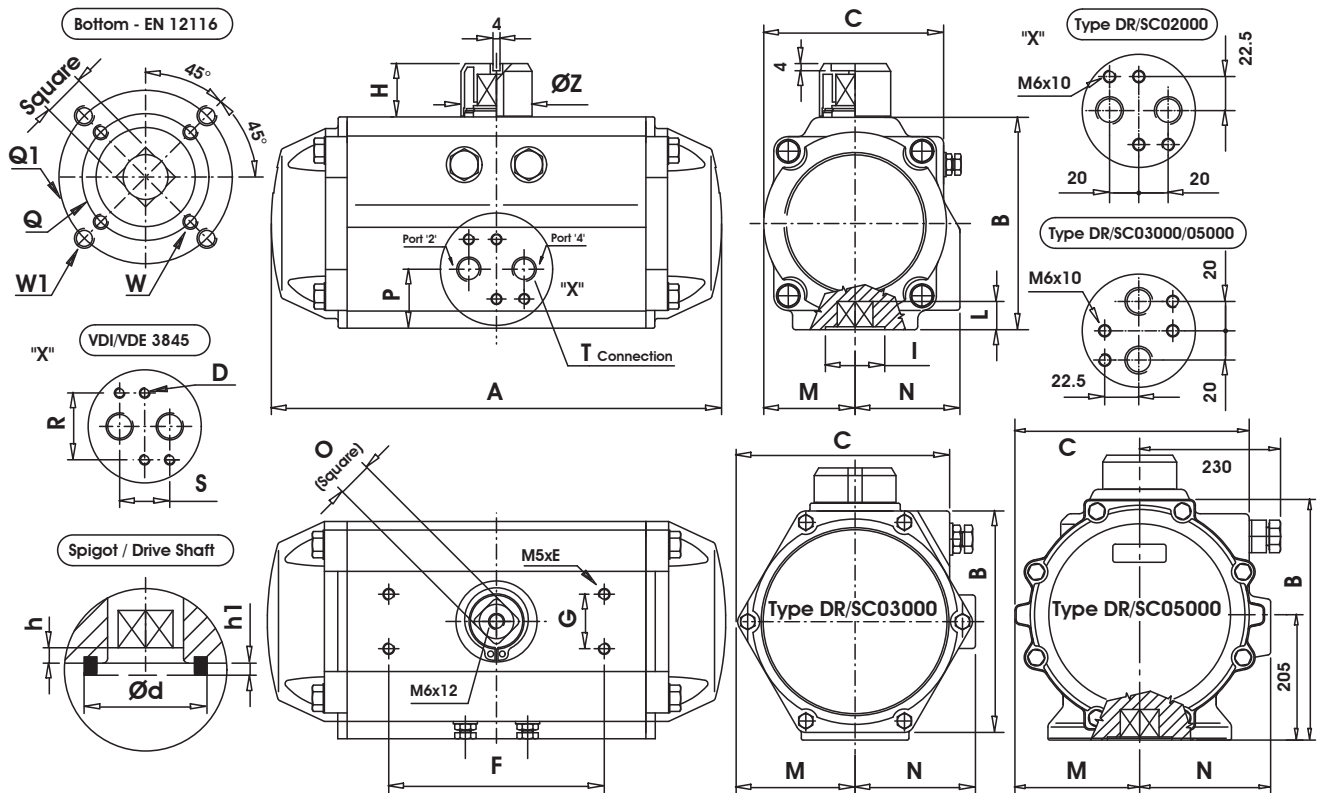
Technical Data

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°
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	20,5	17,8
	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	19,8	16,8
	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	19,2	15,9
	4/5					7,2	4,5	7,9	5,2	8,8	6,1	8,8	6,1	6							10,2	6,6	11,9	8,2	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	33,5	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	36,9	31,7
	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	35,8	30
	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	34,7	28,3
	4/5					13,5	8,3	14,6	9,4	15,2	10	15,2	10	6							18,9	12	21,9	14,9	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	77,7	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	73,2	61,9
	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	71	58,5
	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	68,7	55
	4/5					26,2	15,4	29	17,7	31,2	19,9	31,2	19,9	6							37,5	22,4	43,3	28,3	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	113	94,5
	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	110	88,7
	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	106	82,9
	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	106	82,9
	4/5					40,2	21,2	43,9	24,9	52	33	52	33	6							56,7	31,4	65,8	40,5	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	167	142
	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	167	142
	3/4			44,3	24,6	57,6	37,9	70,9	51,2	76,2	56,5	55,1	35,5	5			69	40,9	82,3	54,2	95,6	67,5	109	80,8	162	134
	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	157	126
	4/5					60,8	35,5	66,1	40,8	70,9	45,6	67,5	45,6	6							85,4	51,7	99	65	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	270	226
	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	270	226
	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	262	213
	4					84,8	45,6	106	67,1	115	75,7	105	65,6	5/6					125	71	146	92,3	168	114	254	200
	4/5					98,1	54	107	62,6	118	73,8	118	73,8	6							138	79	159	101	245	187
00300	2/3	86	56,1	114	83,8	141	111	169	139	180	150	82,4	52,5	4	149	101	165	117	193	145	221	173	248	201	349	295
	3	75,5	39,6	103	67,3	131	95	159	123	170	134	98,9	63	4/5	138	84,3	155	101	182	129	210	156	238	184	349	295
	3/4			93	50,8	120	78,5	148	106	159	117	115	73,5	5			144	84	172	112	200	140	227	168	338	278
	4					110	62	138	89,7	149	101	132	84	5/6					161	96	189	123	217	151	328	262
	4/5					127	73,3	138	84,3	148	94,5	148	94,5	6							179	107	206	135	317	245
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	547	464
	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	547	464
	3/4			146	80	189	124	233	167	250	185	180	115	5			227	134	270	177	314	221	357	264	531	438
	4					173	98	216	142	233	159	206	132	5/6					254	151	297	195	341	238	515	412
	4/5					200	116	217	133	232	148	232	148	6							281	169	324	213	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	706	609
	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	706	609
	3/4			183	108	240	165	297	221	319	244	233	157	5			286	178	343	235	400	292	456	349	683	575
	4					218	131	274	188	297	211	266	180	5/6					320	202	377	259	434	315	661	542
	4/5					252	155	275	178	299	202	299	202	6							355	225	411	282	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	941	799
	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	941	799
	3/4			238	128	315	205	391	281	422	312	332	221	5			373	216	450	292	526	369	603	445	909	752
	4					283	157	360	234	390	264	379	253	5/6					418	245	495	321	571	398	877	704
	4/5					328	186	359	217	426	285	426	285	6							463	274	540	351	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	1319	1135
	3	277	154	383	260	489	367	596	473	638	515	378	255	4/5	511	327	575	390	681	497	787	603				



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	DR/SC
ISO Flange	(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
ISO Flange*	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	1/8"	1/8"	1/8"	1/8"	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	20	20	20	20	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 f8 (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 min	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;