

## 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.



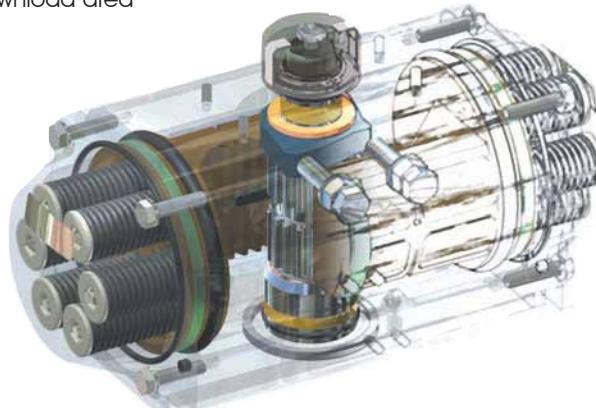
Our team in the sales department, the project planning and in the assemblage assures to you a perfect support and a high quality standard. To guarantee the daily deliveries we maintain the worldwide biggest stock with Air Torque part turn actuators.



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

Interresting news and a lot of technical developments combine reliabeld 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.



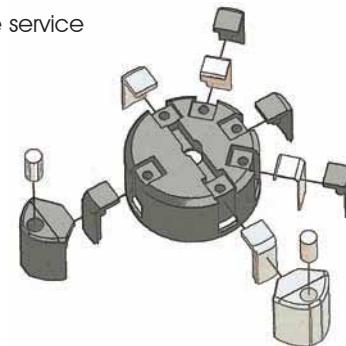
**Advantages**  
of the ALODUR coating:  
extremely abrasion resistant,  
low surface roughness, optimal resistance

- 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).

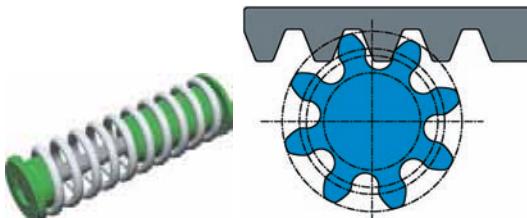
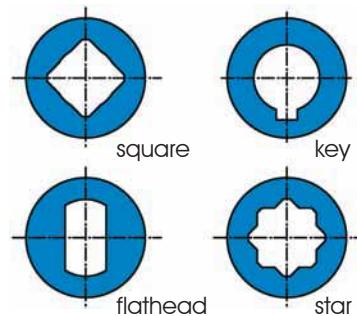


- 4 The connections** - ISO 5211, DIN 3337 (F03-F25), VDI/VDE 3845 (Size 0 to 4)  
ISO 1 (CNOMO) and NAMUR for flexible usability and exchangeability.

### 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.

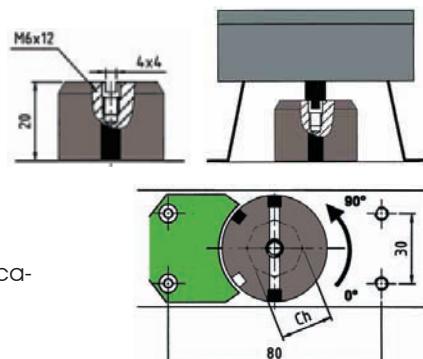
Additional it is possible to adjust the torque through the reliable spring cartridges, made with high quality spring steel, according to the requirements.

### 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.

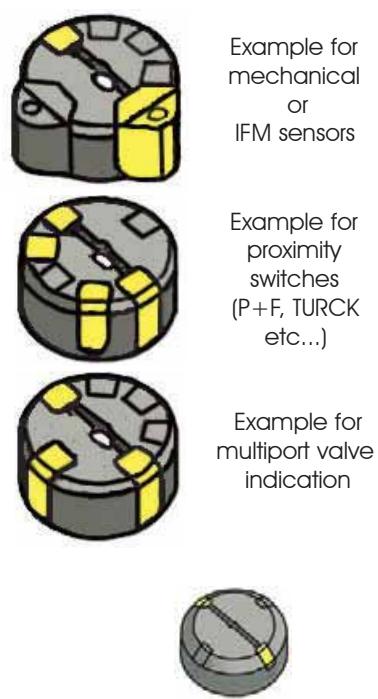
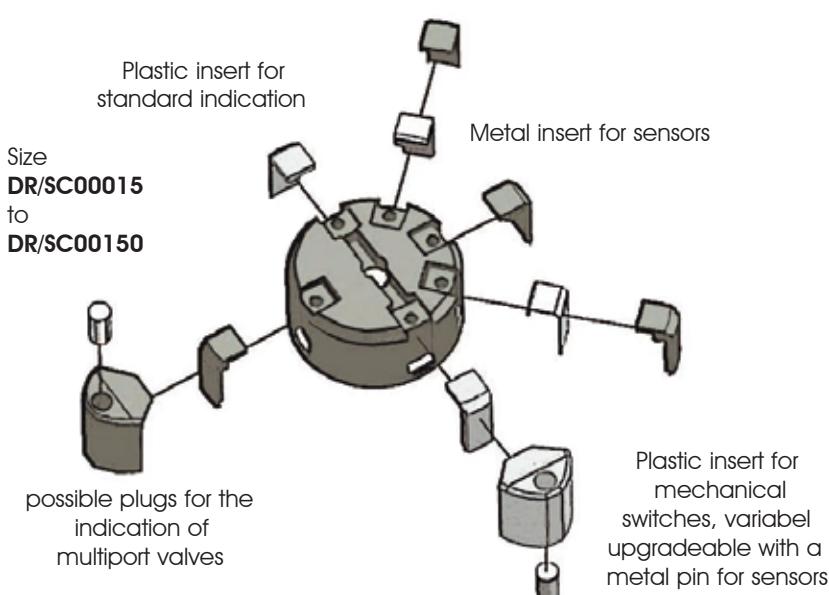
The indicator has a VDI/VDE-interface. So mostly every standard attachment can be mounted without problems.



#### 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 !**



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

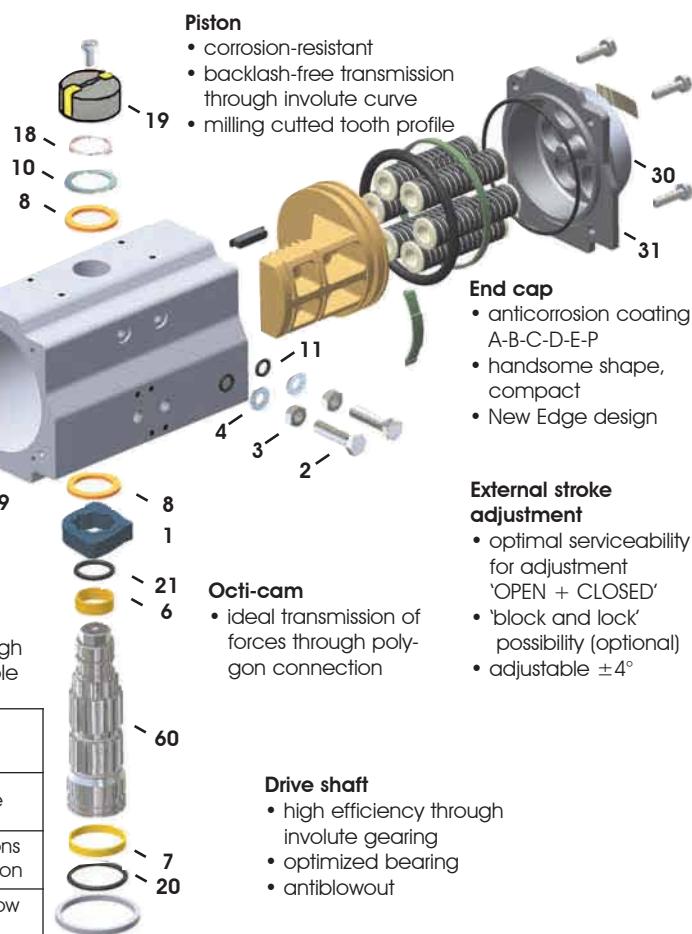
- anticorrosion coating A-B-C-D-E-P
- DIN/ISO 5211, VDI/VDE 3845, NAMUR
- New Edge design

### 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 cut 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 ±4°

Type	Part and Protection		suitable for
	Body	End Caps	
A	ALODUR	chromatized + Polyester 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.

(1) GS400-15 type DR/SC220-5000; (2) 8 pcs. type DR/SC15-2000; 12 pcs. type DR/SC3000; 16 pcs. DR/SC5000; (3) type DR/SC900-3000 end caps are symmetric.

○ included in sparepart kit, \* included in high temperature kit,  
✖ included in low temperature kit

Pos.	Pcs	Part Description	Material	Specification	Protection
01	1	Octi-Cam (Stop Arrangement)	1.4301	EN 10088-3 (1)	
02	2	Stop Cap Screw	A2-70	ISO 3506	
03	2	Nut (Stop Cap Screw)	A2-70	ISO 3506	
05 ○	2	Bearing (Piston Back)	Nylon 46 (4)		
06,07 ○	1	Bearing (Pinion Top/Bottom)	PA 46	Stanyl TW300	
08 ○	2	Thrust Bearing (Pinion)	Nylon 46 (4)		
09 ○*✖	2	Plug (Transfer Port)	NBR	NBR 70 SH. A	
11 ○*✖	2	O' Ring (Stop Cap Screw Seal)	NBR	NBR 70 SH. A	
13	8/12/16 (2)	Cap Screw (End Cap)	A2-70	ISO 3506	
14 ○*✖	2	O' Ring (End Cap)	NBR	NBR 70 SH. A	
15 ○*	2	Bearing (Piston Head)	POM		
16 ○*✖	2	O' Ring (Piston)	NBR	NBR 70 SH. A	
17	min.5/max.12	Spring (Cartridge)	SiCr Spring Alloy Steel	DIN 17223 Part 2	Epoxid
19	1	Position Indicator	PP + 30% GF	Haiplen EP 30	
20,21 ○*✖	1	O' Ring (Pinion Bottom/Top)	NBR	NBR 70 SH. A	
30,31 1 (3)	1	Right/Left End Cap	GD-AISI8.5Cu3.5Fe (4)	UNI 5075	A, B, D, E, P
40	2	Pistons	GD-AISI8.5Cu3.5Fe (4)	UNI 5075	
43	1	Spigot	EN AW 6063 (4)	EN 573/3	Alodur
50	1	Body	EN AW 6063 (4)	EN 573/3	A, B, D, E, P
60	1	Drive Shaft	C22	DIN 17200	ENP

## 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).

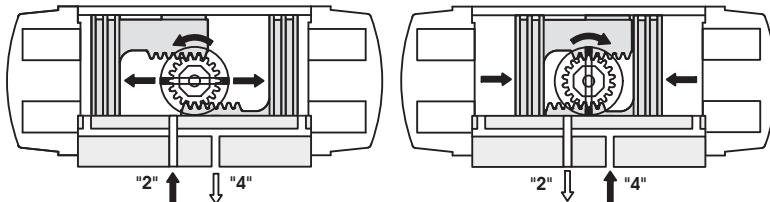


Fig. DR02: Top view and principle of a double acting actuator under pressure

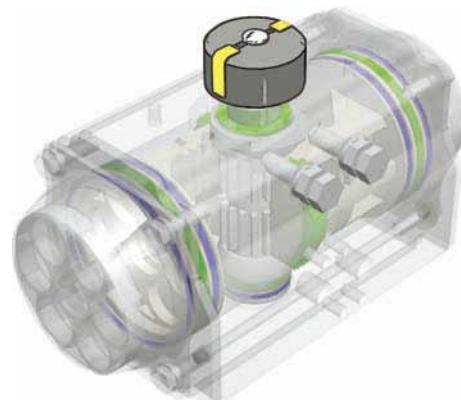


Fig. DR01:  
Principle of a doubleacting actuator

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%.

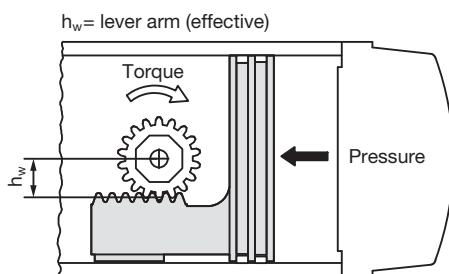


Fig. DR03: Top view of a double acting actuator under pressure

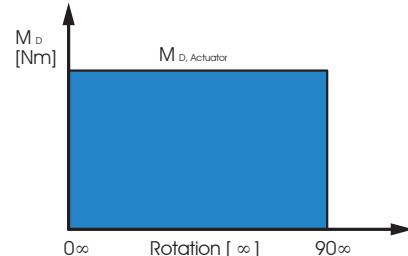


Fig. DR04: Principle of the torque (double acting)

## 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.

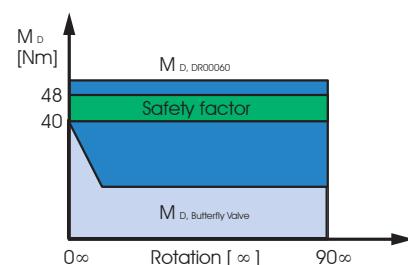


Fig. DR05:  
Principle of the sizing a double-acting actuator

### Protection and Serviceability

Representation	Type	Part and Protection				suitable for
		Body	End Caps	Drive Shaft	Pistons	
	A	ALODUR	chromatized and polyester coated	carbon steel ENP	normal anodized	general service
	Coating Colour	30 - 35 µm bright S.S.	80 - 90 µm S.S. Ral 9007	25 - 30 µm	15 - 20 µm black	
	B	ALODUR + PTFE coating	chromatized and polyester coated	carbon steel ENP	normal anodized	general service, acid or basic solutions in low concentration
	Coating Colour	30-35/25-30 µm light grey	80 - 90 µm S.S. Ral 9007	25 - 30 µm	15 - 20 µm black	
	D	ALODUR + PTFE coating	chromatized and PTFE coating	carbon steel ENP	normal anodized	aggressive environment, acid or basic solutions
	Coating Colour	30-35/25-30 µm light grey	80 - 90 µm light grey	25 - 30 µm	15 - 20 µm black	
	E	ALODUR + PTFE coating	chromatized and PTFE coating	stainless steel	normal anodized	acid or basic solutions, seawater
	Coating Colour	30-35/25-30 µm light grey	80 - 90 µm light grey		15 - 20 µm black	
	P	ALODUR	resin impregnated + hard anodized	carbon steel ENP	normal anodized	acid or basic solutions, seawater
	Coating Colour	30-35 µm bright S.S.	30 - 35 µm bright S.S.	25 - 30 µm	15 - 20 µm black	
	EC	ALODUR+ EPOXY	chromatiert + EPOXY	Edelstahl	normal anodized	general service, acid or basic solutions in low concentration
	Coating Colour	80-95 µm blue grey	80 - 95 µm blue grey		15 - 20 µm black	

#### 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
<b>00006</b>	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
<b>00015</b>	8,3	10	11,6	13,3	14	15	16,6	18,3	19,9	21,6	23,3	24,9	26,6
<b>00030</b>	14,7	17,6	20,5	23,5	24,6	26,4	29,3	32	35,2	38,1	41	44	46,9
<b>00060</b>	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
<b>00100</b>	45,8	54,9	64,1	73,2	76,9	82,4	91,5	101	110	120	128	138	146
<b>00150</b>	66,5	79,8	93,1	106	112	120	133	146	160	173	186	199	213
<b>00220</b>	107	129	150	172	181	193	215	236	258	279	301	322	344
<b>00300</b>	138	166	194	222	233	249	277	305	332	360	388	415	443
<b>00450</b>	217	261	304	348	365	391	435	478	522	565	609	652	696
<b>00600</b>	284	340	397	454	477	511	567	624	681	737	794	851	908
<b>00900</b>	383	459	536	613	643	689	766	842	919	996	1072	1149	1225
<b>01200</b>	532	638	745	851	893	957	1064	1170	1276	1383	1489	1595	1702
<b>02000</b>	893	1072	1251	1430	1501	1608	1787	1966	2144	2318	2502	2684	2859
<b>03000</b>	1297	1556	1815	2075	2179	2334	2594	2853	3112	3372	3631	3890	4150
<b>05000</b>	2252	2703	3153	3604	3784	4054	4504	4955	5405	5855	6306		
<b>10000</b>	4169	5003	5837	6671	7005	7505	8339	9173	10007	10841	11674		

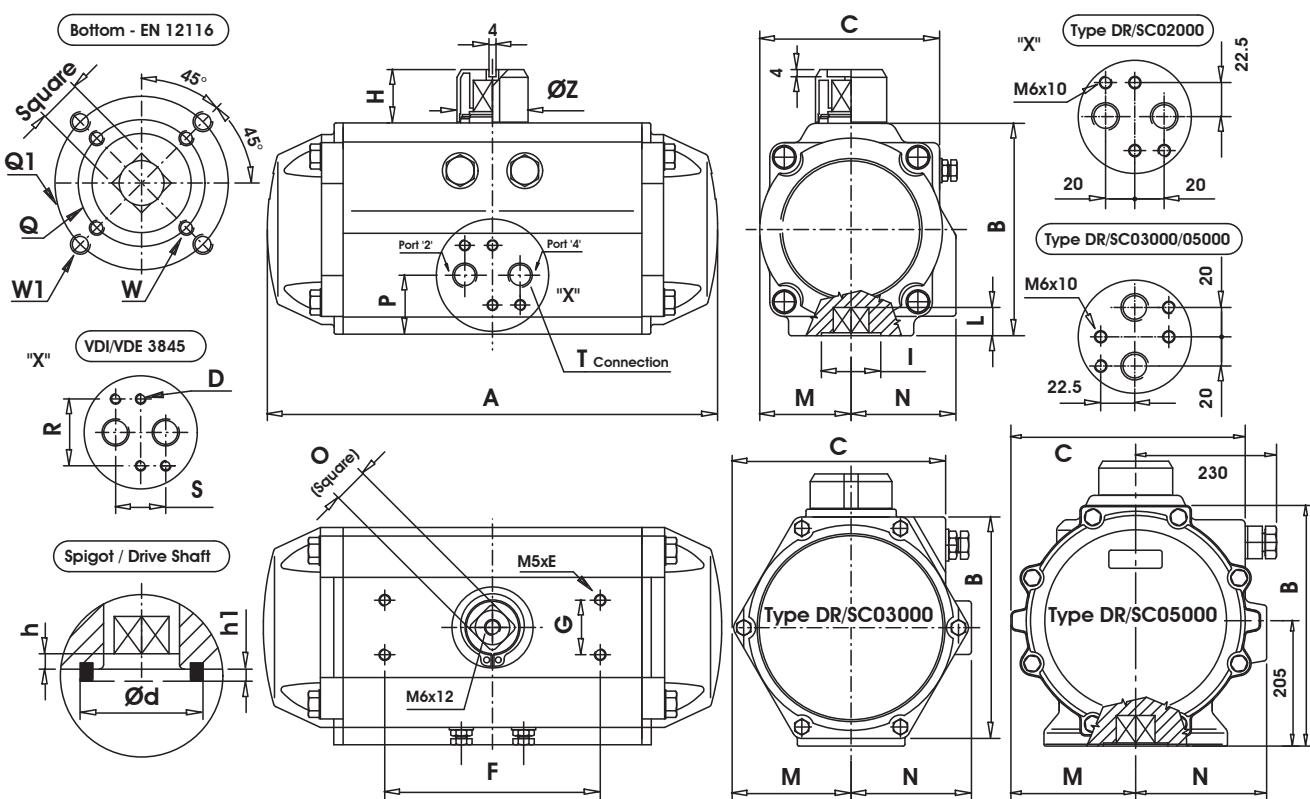
example of layout DR900 at 5,5bar air supply -> 842Nm output torque



**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°	90° 0°	0° 90°		0° 90°	0° 90°	0° 90°	0° 90°	0° 90°	0° 90°	0° 90°
00015	2/3	4,9 <b>3,4</b>	6,6 5,1	8,3 6,8	9,9 8,4	10,6 9,1	4,9 3	4	8,6 <b>6,2</b>	9,6 7,2	11,2 8,8	12,9 10,5	14,6 12,1	17,8	5,4
	3	4,3 2,5	<b>5,9</b> <b>4,1</b>	7,6 5,8	9,3 7,4	9,9 8,1	5,8 4	4/5	<b>8,9</b> <b>6,2</b>	10,6 7,8	12,2 9,5	13,9 11,2	20,5 17,8	8,8 6,1	
	3/4		5,3 3,1	<b>6,9</b> <b>4,8</b>	8,6 6,5	9,2 7,1	6,8 4,7	5		8,2 5,2	<b>9,9</b> <b>6,9</b>	11,5 8,5	13,2 10,2	19,8 16,8	9,7 6,7
	4			6,2 3,8	<b>7,9</b> <b>5,5</b>	<b>8,6</b> <b>6,2</b>	7,8 5,4	5/6			9,2 5,9	<b>10,9</b> <b>7,6</b>	12,5 9,2	19,2 15,9	10,7 7,4
	4/5				7,2 4,5	7,9 5,2	8,8 6,1	6				10,2 6,6	<b>11,9</b> <b>8,2</b>	<b>18,5</b> <b>14,9</b>	11,7 8,1
00030	2/3	9,1 <b>6,2</b>	12 9,2	15 12,1	17,9 15	19,1 16,2	8,4 6	4	<b>15,7</b> <b>11,1</b>	17,5 12,9	20,4 15,8	23,4 18,7	26,3 21,7	13,5 9	
	3	8 4,5	<b>10,9</b> <b>7,5</b>	13,9 10,4	16,8 13,3	18 14,5	10,1 7	4/5	15 9,4	<b>16,4</b> <b>11,2</b>	19,3 14,1	22,3 17,1	25,2 20	36,9 31,7	15,2 10
	3/4		9,8 5,8	<b>12,8</b> <b>8,7</b>	15,7 11,6	16,9 12,8	11,8 7,8	5		15,3 9,5	<b>18,2</b> <b>12,4</b>	21,1 15,4	24,1 18,3	35,8 30	16,9 11,1
	4			11,6 7	<b>14,6</b> <b>10</b>	<b>15,7</b> <b>11,1</b>	13,5 9	5/6			17,1 10,8	<b>20</b> <b>13,7</b>	23 16,6	34,7 28,3	18,6 12
	4/5				13,5 8,3	14,6 9,4	15,2 10	6				18,9 12	<b>21,9</b> <b>14,9</b>	<b>33,6</b> <b>26,7</b>	20,2 13,3
00060	2/3	18 <b>11,8</b>	23,8 17,6	29,7 23,4	35,5 29,9	37,8 31,6	17,3 11,1	4	<b>31,2</b> <b>21,2</b>	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	<b>21,6</b> <b>14,1</b>	27,5 19,9	33,3 25,8	35,6 28,1	20,8 13,3	4/5	29 17,7	<b>32,5</b> <b>21,2</b>	38,3 27	44,1 32,8	49,9 38,6	73,2 61,9	31,2 19,9
	3/4		19,4 10,7	<b>25,2</b> <b>16,5</b>	31,1 22,3	33,4 24,6	24,2 15,5	5		30,2 17,7	<b>36,1</b> <b>23,6</b>	41,9 29,4	47,7 35,2	71 58,5	34,6 22,1
	4			23 13	<b>28,8</b> <b>18,8</b>	<b>31,2</b> <b>21,2</b>	27,7 17,7	5/6			33,8 20,1	<b>39,7</b> <b>25,9</b>	45,5 31,7	68,7 55	38,1 24,3
	4/5				26,2 15,4	29 17,7	31,2 19,9	6				37,5 22,4	<b>43,3</b> <b>28,3</b>	<b>66,5</b> <b>51,5</b>	41,5 26,5
00100	2/3	<b>27,4</b> <b>16,9</b>	36,6 26	45,7 35,2	54,9 44,3	58,5 48	28,9 18,3	4	<b>47,5</b> <b>30,7</b>	53 36,2	62,2 45,3	71,3 54,5	80,5 63,6	46,2 29,3	
	3	23,8 11,1	<b>32,9</b> <b>20,3</b>	42,1 29,4	51,2 38,6	54,9 42,2	34,7 22	4/5	43,9 24,9	<b>49,4</b> <b>30,4</b>	58,5 39,5	67,7 48,7	76,8 57,8	113 94,5	52 33
	3/4		29,2 14,5	<b>38,4</b> <b>23,6</b>	47,5 32,8	51,2 36,4	40,4 25,7	5		45,7 24,6	<b>54,8</b> <b>33,8</b>	64 42,9	73,1 52,1	110 88,7	57,8 36,7
	4			34,7 17,9	<b>43,9</b> <b>27</b>	<b>47,5</b> <b>30,7</b>	46,2 29,3	5/6			51,2 28	<b>60,3</b> <b>37,1</b>	69,5 46,3	106 82,9	63,5 40,3
	4/5				40,2 21,2	43,9 24,9	52 33	6				56,7 31,4	<b>65,8</b> <b>40,5</b>	<b>102</b> <b>77,1</b>	69,3 44
00150	2/3	<b>41,1</b> <b>27,1</b>	54,4 40,4	67,7 53,7	81 67	86,3 72,3	39,4 25,3	4	<b>71,1</b> <b>48,7</b>	79,1 56,6	92,4 69,9	106 83,2	119 96,5	63 40,5	
	3	36,1 19,2	<b>49,4</b> <b>32,5</b>	62,7 45,8	76 59,1	81,3 64,4	47,3 30,4	4/5	66 40,8	<b>74</b> <b>48,8</b>	87,3 62,1	101 75,3	113,9 88,6	167 142	70,9 45,6
	3/4		44,3 24,6	<b>57,6</b> <b>37,9</b>	70,9 51,2	76,2 56,5	55,1 35,5	5		69 40,9	<b>82,3</b> <b>54,2</b>	95,6 67,5	109 80,8	162 134	78,8 50,7
	4			52,5 30	<b>65,8</b> <b>43,3</b>	<b>71,1</b> <b>48,7</b>	63 40,5	5/6			77,2 46,3	<b>90,5</b> <b>59,6</b>	104 72,9	157 126	86,7 55,7
	4/5				60,8 35,5	66,1 40,8	70,9 45,6	6				85,4 51,7	<b>99</b> <b>65</b>	<b>152</b> <b>118</b>	94,5 60,8
00220	2/3	<b>66,5</b> <b>41,9</b>	87,9 63,4	109 84,9	131 106	140 115	65,5 41	4	<b>115</b> <b>75,7</b>	128 88,6	149 110	171 132	192 153	105 65,6	
	3	58,3 28,8	<b>79,7</b> <b>50,3</b>	101 71,8	123 93,3	131 102	78,6 49,2	4/5	107 62,6	<b>120</b> <b>75,5</b>	141 97	163 118	184 140	270 226	118 73,8
	3/4		71,5 37,2	<b>93</b> <b>59</b>	115 80,2	123 88,8	91,7 57,4	5		111 62	<b>133</b> <b>83,9</b>	154 105	176 127	262 213	131 82
	4			84,8 45,6	<b>106</b> <b>67,1</b>	<b>115</b> <b>75,7</b>	105 65,6	5/6			125 71	<b>146</b> <b>92,3</b>	168 114	254 200	144 90,2
	4/5				98,1 54	107 62,6	118 73,8	6				138 79	<b>159</b> <b>101</b>	<b>245</b> <b>187</b>	157 98,4
00300	2/3	<b>86</b> <b>56,1</b>	114 83,8	141 111	169 139	180 150	82,4 52,5	4	<b>149</b> <b>101</b>	165 117	193 145	221 173	248 201	132 84	
	3	75,5 39,6	<b>103</b> <b>67,3</b>	131 95	159 123	170 134	98,9 63	4/5	138 84,3	<b>155</b> <b>101</b>	182 129	210 156	238 184	349 295	148 94,5
	3/4		93 50,8	<b>120</b> <b>78,5</b>	148 106	159 117	115 73,5	5		144 84	<b>172</b> <b>112</b>	200 140	227 168	338 278	165 105
	4			110 62	<b>138</b> <b>89,7</b>	<b>149</b> <b>101</b>	132 84	5/6			161 96	<b>189</b> <b>123</b>	217 151	328 262	181 116
	4/5				127 73,3	138 84,3	148 94,5	6				179 107	<b>206</b> <b>135</b>	<b>317</b> <b>245</b>	198 126
00450	2/3	<b>135</b> <b>88,6</b>	179 132	222 176	265 219	283 236	129 82,4	4	<b>233</b> <b>159</b>	260 185	303 229	347 272	390 316	206 132	
	3	119 63	<b>162</b> <b>106</b>	206 150	249 193	266 211	155 99	4/5	217 133	<b>243</b> <b>159</b>	287 203	330 246	374 290	547 464	232 148
	3/4			146 80	<b>189</b> <b>124</b>	233 167	250 185	5		227 134	<b>270</b> <b>177</b>	314 221	357 264	531 438	258 165
	4				<b>216</b> <b>142</b>	<b>233</b> <b>159</b>	206 132	5/6			254 151	<b>297</b> <b>195</b>	341 238	515 412	283 181
	4/5				200 116	217 133	232 148	6				281 169	<b>324</b> <b>213</b>	<b>498</b> <b>386</b>	309 198
00600	2/3	<b>171</b> <b>118</b>	228 174	285 231	342 288	364 310	166 112	4	<b>297</b> <b>211</b>	331 245	388 302	444 358	501 415	266 180	
	3	149 84	<b>206</b> <b>141</b>	262 198	319 255	342 277	199 135	4/5	275 178	<b>309</b> <b>212</b>	365 268	422 325	479 382	706 609	299 202
	3/4		183 108	<b>240</b> <b>165</b>	297 221	319 244	233 157	5		286 178	<b>343</b> <b>235</b>	400 292	456 349	683 575	332 224
	4			218 131	<b>274</b> <b>188</b>	<b>297</b> <b>211</b>	266 180	5/6			320 202	<b>377</b> <b>259</b>	434 315	661 542	365 247
	4/5				252 155	275 178	299 202	6				355 225	<b>411</b> <b>282</b>	<b>638</b> <b>509</b>	399 269
00900	2/3	<b>225</b> <b>146</b>	301 223	378 299	455 376	485 406	237 158	4	<b>390</b> <b>264</b>	436 310	513 387	589 464	666 540	379 253	
	3	193 99	<b>270</b> <b>175</b>	346 252	423 329	454 359	284 190	4/5	359 217	<b>405</b> <b>263</b>	481 340	558 416	634 493	941 799	426 285
	3/4			238 128	<b>315</b> <b>205</b>	391 281	422 312	5		373 216	<b>450</b> <b>292</b>	526 369	603 445	909 752	474 316
	4			283 157	<b>360</b> <b>234</b>	<b>390</b> <b>264</b>	379 253	5/6			418 245	<b>495</b> <b>321</b>	571 398	877 704	521 348
	4/5				328 186	359 217	426 285	6				463 274	<b>540</b> <b>351</b>	<b>846</b> <b>657</b>	568 379
01200	2/3	<b>319</b> <b>217</b>	426 323	532 430	638 536	681 578	315 213	4	<b>553</b> <b>390</b>	617 453	723 560	830 666	936 772	504 340	
	3	277 154	<b>383</b> <b>260</b>	489 367	596 473	638 515	378 255	4/5	511 327	<b>575</b> <b>390</b>	681 497	787 603	894 709	1319 1135	567 383
	3/4		341 197	<b>447</b> <b>304</b>	553 410	596 453	441 298	5		532 327	<b>638</b> <b>434</b>	745 540	851 646	1277 1072	630 425
	4			404 241	<b>511</b> <b>347</b>	<b>553</b> <b>390</b>	504 340	5/6			596 371	<b>702</b> <b>477</b>	809 583	1234 1009	693 468



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	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	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	<b>50</b>	50	<b>70</b>	70	70	102	102	140	140	165	165	254	298
Q1*	-	-	70	<b>70</b>	102	<b>102</b>	<b>102</b>	<b>125</b>	<b>125</b>	-	-	-	-	-	-
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) <b>M6</b>	<b>M6</b>	M6	<b>M8</b>	M8	M8	M10	M10	M16	M16	M20	M20	8xM16	8xM20
W1*	-	-	M8	<b>M8</b>	M10	<b>M10</b>	<b>M10</b>	<b>M12</b>	<b>M12</b>	-	-	-	-	-	-
ø d 18 (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, F, G only one flange (bold printed); (A) and data in brackets -> on request;