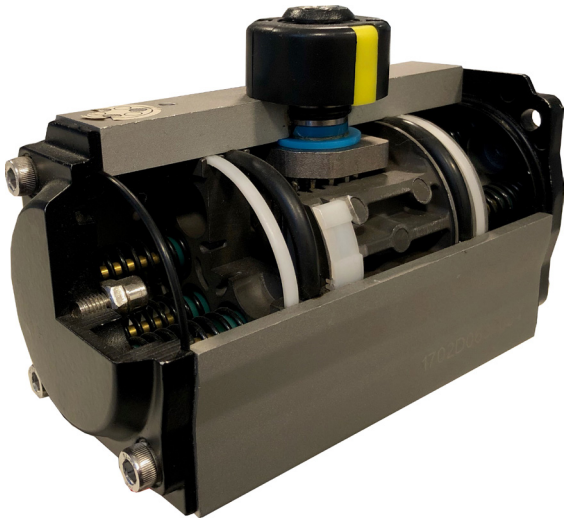
MODU®

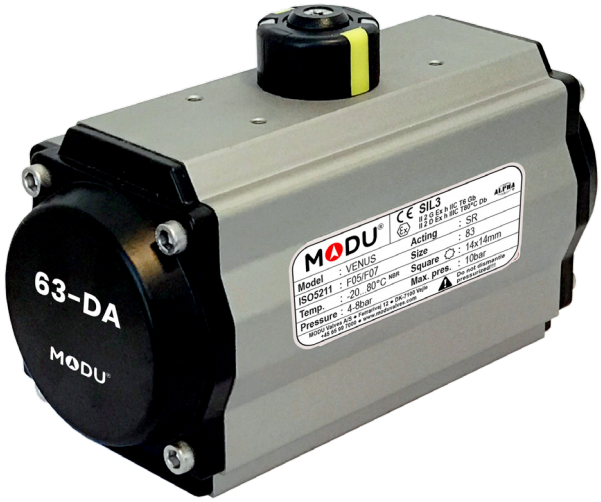
Indhold

1.0 (DK) Introduktion
1.1 (DK) Dele
1.2 (DK) Driftsform - dobbeltvirkende
1.3 (DK) Driftsform - enkeltvirkende
2.0 (DK) Enkeltdele
2.1 (DK) Moment - dobbeltvirkende
2.2 (DK) Moment - enkeltvirkende
3.0 (DK) Driftsbetingelser
4.0 (DK) Installation
4.1 (DK) Ændring af fjedrepakker
4.2 (DK) Justering af stopbolte
5.0 (DK) Vedligehold
6.0 (DK) Opbevaring og håndtering

Content

(UK) Introduction
(UK) Design
(UK) Operating principle - double acting
(UK) Operating principle - spring return
(UK) Parts list
(UK) Output torque - double acting
(UK) Output torque - spring return
(UK) Operation conditions
(UK) Installation
(UK) Spring mounting form
(UK) Adjustment of stop bolts
(UK) Maintenance
(UK) Storage and handling





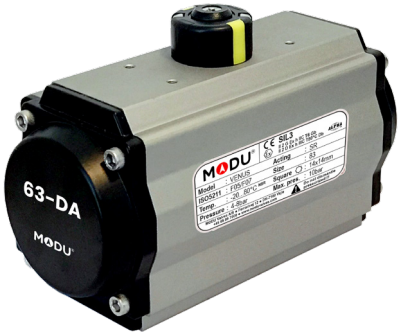
(DK) Installation, drift og vedligeholdelsesmanual
(UK) Installation, operation and maintenance manual

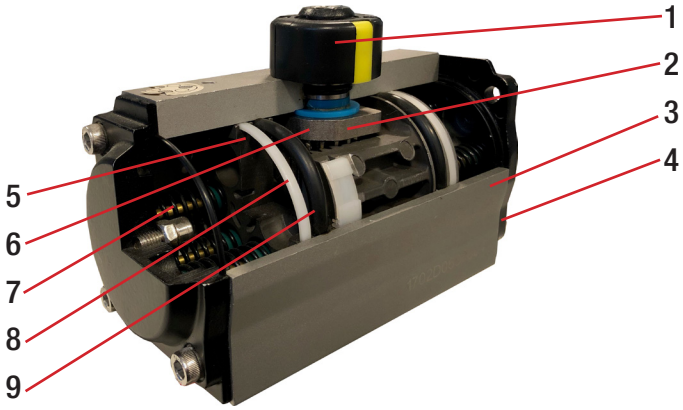
VENUS pneumatisk aktuator
VENUS pneumatic actuator

1.0 (DK) Introduktion
1.0 (UK) Introduction

(DK) VENUS pneumatiske aktuator er af typen rack & pinion, den er fremstillet i aluminum og findes i udgaverne dobbeltvirkende og enkeltvirkend. Den inovative konstruktion er patenteret. Aktuatoren har indikator for montage af induktiv feedback samt justering af åbne- og lukkevinklerne som standard. VDI/VDE montagehuller i toppen for montage af mekanisk boks eller positioner. Aktuatoren er beregnet for 90° drejende ventiler.

(UK) VENUS Pneumatic Actuator is an aluminium rack & pinion actuators in double acting and spring return based on innovative and patented technology. This kind of actuator features a top mount multifunction indicator for inductive feedback and open-close stop adjustment as a standard. VDI/VDE top connection for machanical switchbox or positioner. Actuators are designed for 90° turn valves.





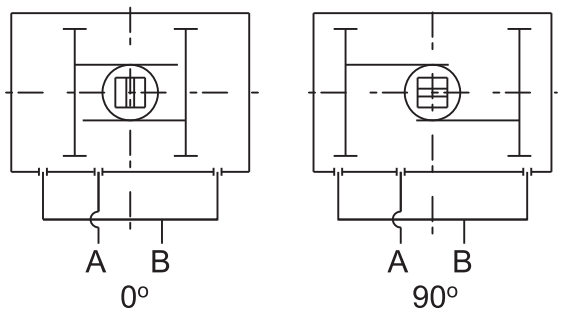
1.1 (DK) Dele
1.1 (UK) Structure

(DK)
1. Indikator) Aktuatortop/indikator med VDI/VDE interface for let monatge af tilbehør så som mekanisk boks, positioner m.fl.
2. Spindel) Spindlen er præcisionsfremstillet i nikkelstål og er fuldt kampatibel med ISO5211,DIN3337 og NAMUR.
3. Aktuator krop) Fremstillet i hårdanodiseret ekstruderet aluminium ASTM6005. Optioner: Pulverlakeret overfladt, PTFE coating eller fornikling.
4. Endedæksler) Sprøjtestøbt aluminum med pulverlakering. Optioner: PTFE coating eller fornikling.
5. Stempler) Dobbeltstemplerne er fremstillet i hårdanodiseret aluminium. Den symetriske montage giver en lang levetid og hurtige skiftetider. Omvendt rotationsretning kan ske ved at vende stemplerne.
6. Justering) De to uafhængige justeringsbolte og kam giver mulighed for let og præcis justerer aktuatoren ±5° i både åbne- og lukkeretning.
7. High performance fjedre) De indspændte fjedrepakker er fremstillet i anti korrosionsbehandlet stål som sikre en lang levetid. Fjedrepakkerne/antal kan ændres for at justerer det resuleterede aktuatormoment.
8. Glidelejer) Fremstillet i lavfriktion compound der forhidre direkte matalisk kontakt mellem delene.
9. O-ringe) NBR o-ringe giver problemfri drift ved normale omgivelsestemperaturer. Optioner: For høj- og lavtemperatur kan der tilvælges viton eller silkone o-ringe.

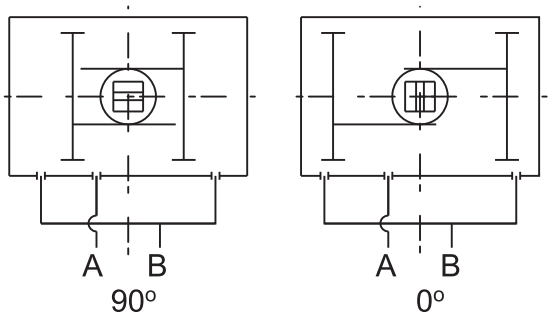
(UK)
1. Indicator) Position indicator with VDI/VDE connection is convenient for mounting accessories such as limit switch box, positioner and so on.
2. Pinion) The pinion is mad from high-precision nickel alloy steel, fully compatible with the latest standards of ISO5211,DIN3337 and NAMUR.
3. Actuator body) The extruded aluminium alloy ASTM6005 body are treated with hard anodized surface. Options: Powder polyester painted, PTFE or nickel plated.
4. End caps) Die-casting aluminium powder polyester painted. Optins: PTFE or nickel plated.
5. Pistons) The twin rack pistons are made from die-casting aluminium treated with hard anodized. Symmetric mounting position, long cycle life and fast operation, reversing rotation by simply inverting the pistons.
6. Travel adjustment) The two independent external travel stop adjustment bolts can adjust ±5°at both open and close directions easily and precisely.
7. High performance springs) Preloaded coated springs are made from the high quality steel coated to resist corrosion and with longer cycle life. Springs can be reconfigurated to change output torque.
8. Bearings & guides) Made from low friction, long-life compound material, to avoid the direct contact between metals.
9. O-rings) NBR rubber o-rings provide trouble-free operation at standard temperature ranges. Options: For high and low temperature, viton or silicone is used.

1.2 (DK) Driftsform - dobbeltvirkende
1.2 (UK) Operating principle - double acting

DA standard rotation



DA reverse rotation



(DK) Standard rotation: Luft til port A bevæger stemplerne udad og roterer spindlen venstre om mod uret, mens der afluftes fra port B. Luft til port B bevæger stemplerne indad og roterer spindlen højre om med uret, mens der afluftes fra port A.

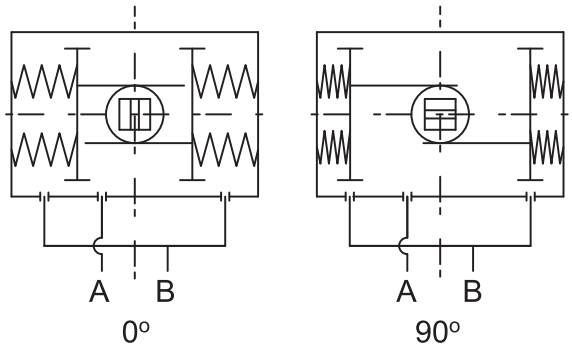
Omvendt (reverse) rotation: Luft til port A bevæger stemplerne udad og roterer spindlen højre om med uret, mens der afluftes fra port B. Luft til port B bevæger stemplerne indad og roterer spindlen venstre om mod uret, mens der afluftes fra port A.

(UK) Standard Rotation: Air to port A forces the pistons outwards, causing the pinion to turn counter clockwise while the air is being exhausted from port B. Air to port B forces the pistons inwards, causing the pinion to turn clockwise while the air is being exhausted from port A.

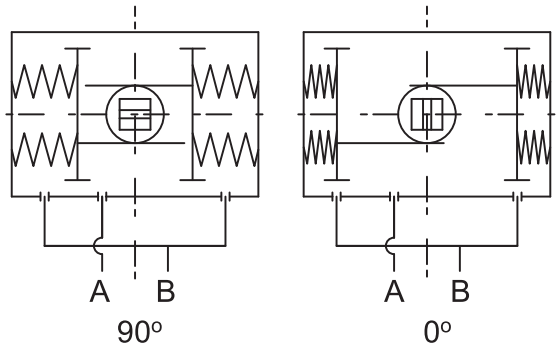
Reverse Rotation: Air to port A forces the pistons outwards, causing the pinion to turn clockwise while the air is being exhausted from port B. Air to port B forces the pistons inwards, causing the pinion to turn counter clockwise while the air is being exhausted from port A.

1.3 (DK) Driftsform - enkeltvirkende fjeder retur
1.3 (UK) Operating principle - spring return

SR standard rotation



SR reverse rotation



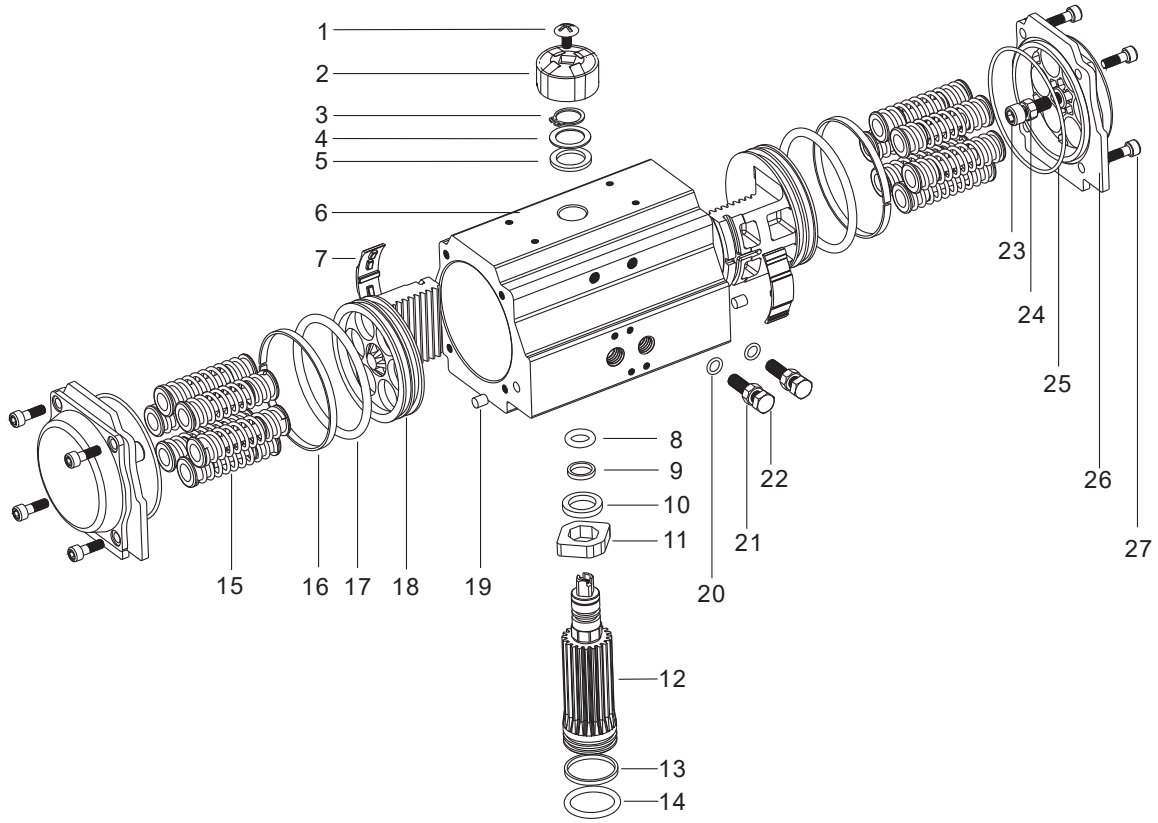
(DK) Standard rotation: Luft til port A bevæger stemplerne udad mens fjedrene komprimeres og roterer spindlen venstre om mod uret, mens der afluftes fra port B. Når lufttrykket forsvinder fra port A presser fjedrene stemplerne udad. Spindlen drejer højre om med uret mens der afluftes fra port A.

Omvendt (reverse) rotation: Luft til port A bevæger stemplerne udad mens fjedrene komprimeres og roterer spindlen højre om med uret, mens der afluftes fra port B. Når lufttrykket forsvinder fra port A presser fjedrene stemplerne udad. Spindlen drejer venstre om mod uret mens der afluftes fra port A.

(UK) Standard rotation: Air to port A forces the pistons outwards, causing the springs to compress, the pinion turns counter clockwise while air is being exhausted from port B. Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The pinion turns clockwise while air is being exhausted from port A

Reverse rotation: Air to port A forces the pistons outwards, causing the springs to compress, the pinion turns clockwise while air is being exhausted from port B. Loss of air pressure on port A, the stored energy in the springs forces the pistons inwards. The pinion turns counter clockwise while air is being exhausted from port A.

2.0 (DK) Enkeltdele
2.0 (UK) Parts list



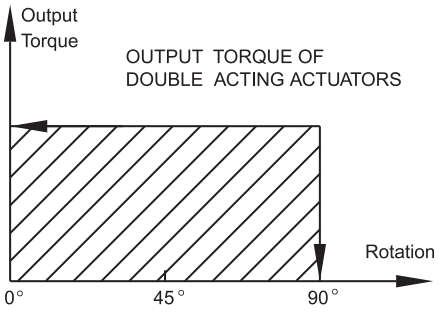
(DK) Materialebeskrivelse

Pos	Beskrivelse	Materiale
1	Indikatorbolt	Rustfri stål AISI304 / ABS
2	Indikator / aftaster	Plast (ABS) / AISI304
3	Låsering	Rustfri stål AISI304
4	Skive	Rustfri stål AISI304
5	Glidering	POM
6	Hus	Aluminium (6005-T5)
7	Glidesko	POM
8	O-ring	NBR
9	Bøsning	POM
10	Bøsning	POM
11	Stopkam	Stål 45
12	Spindel	Stål 45, forniklet
13	Bøsning	POM
14	O-ring	NBR
15	Fjederpakke (Ikke DA)	Fjederstål
16	Glidering	POM
17	O-ring	NBR
18	Stempel	Aluminium (A380)
19	Prop	NBR
20	O-ring	NBR
21	Kontramøtrik	Rustfri stål AISI304 / A2
22	Justerbolt	Rustfri stål AISI304 / A2
23	Stopbolt	Rustfri stål AISI304 / A2
24	Kontramøtrik	Rustfri stål AISI304 / A2
25	O-ring	NBR
26	Endedæksel	Aluminium (A380)
27	Umbracobolt	Rustfri stål AISI304 / A2

(UK) Materials

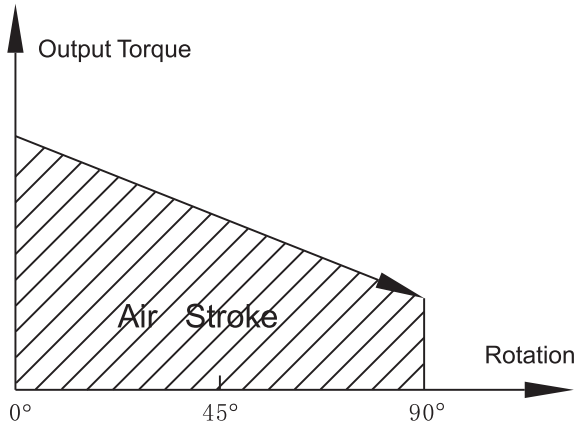
Pos	Description	Material
1	Indicator bolt	Stainless Steel AISI304/ABS
2	Indicator	Plastic (ABS) / AISI304
3	Circlip	Stainless Steell AISI304
4	Trust washer	Stainless Steel AISI304
5	Outside washer	POM
6	Body	Aluminum (6005-T5)
7	Guide	POM
8	O-ring	NBR
9	Bearing	POM
10	Inside washer	POM
11	Cam	Steel 45
12	Pinion	Steel 45, nickel-plated
13	Bearing	POM
14	O-ring	NBR
15	Spring (Not DA)	Spring steel
16	Bearing	POM
17	O-ring	NBR
18	Piston	Aluminum (A380)
19	Plug	NBR
20	O-ring	NBR
21	Nut	Stainless Steel AISI304 / A2
22	Adjust screw / bolt	Stainless Steel AISI304 / A2
23	Stop bolt	Stainless Steel AISI304 / A2
24	Stop nut	Stainless Steel AISI304 / A2
25	O-ring	NBR
26	End cap	Aluminum (A380)
27	Cap screw	Stainless Steel AISI304 / A2

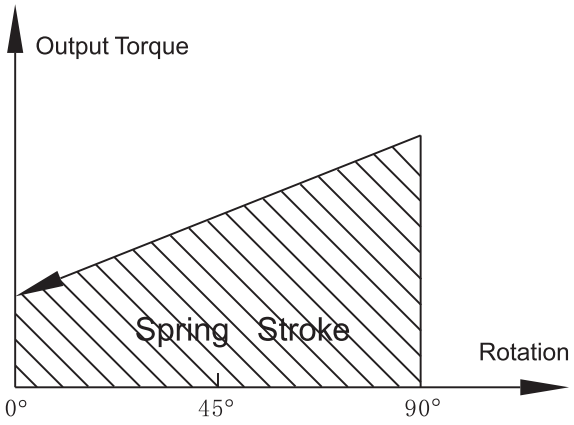
2.1 (DK) Moment - Dobbeltvirkende [Nm]
2.1 (UK) Output Torque - Double acting [Nm]



OUTPUT TORQUE OF V E N U S PNEUMATIC ACTUATOR - DOUBLE ACTING(Unit:Nm)										
Model	Air pressure(Bar)									
	2	2.5	3	4	4.5	5	5.5	6	7	8
D40DA	4.8	6	7.2	9.5	10.7	11.9	13.1	14.3	16.7	19.1
D52DA	8.0	10.0	12.0	16.0	18.0	20.0	21.9	23.9	27.9	31.9
D63DA	14.6	18.2	21.9	29.2	32.8	36.5	40.1	43.8	51.1	58.4
D75DA	20.1	25.1	30.1	40.1	45.1	50.2	55.2	60.2	70.2	80.3
D83DA	31.4	39.2	47.0	62.7	70.5	78.4	86.2	94.1	109.7	125.4
D92DA	45.1	56.4	67.7	90.3	101.6	112.9	124.1	135.4	158.0	180.6
D105DA	66.1	82.7	99.2	132.2	148.8	165.3	181.8	198.4	231.4	264.5
D125DA	100.3	125.4	150.5	200.6	225.7	250.8	275.9	301.0	351.1	401.3
D140DA	171.0	213.8	256.5	342.0	384.8	427.5	470.3	513.0	598.5	684.0
D160DA	266.0	332.5	399.0	532.0	598.5	665.0	731.5	798.0	931.0	1064.0
D190DA	425.6	532.0	638.4	851.2	957.6	1064.0	1170.4	1276.8	1489.6	1702.4
D210DA	532.0	665.0	798.0	1064.0	1197.0	1330.0	1463.0	1596.0	1862.0	2128.0
D240DA	796.5	961.9	1154.3	1539.0	1731.4	1923.8	2116.1	2308.5	2693.3	3078.0
D270DA	1169.6	1462.1	1754.5	2339.3	2631.7	2924.1	3216.5	3508.9	4093.7	4678.6
D300DA	1526	1908	2671	3052	3434	3815	4197	4578	5341	6104
D350DA	2285	2856	3999	4570	5141	5712	6283	6854	7997	9139

2.2 (DK) Moment - enkeltvirkende fjeder retur [Nm]
2.2 (UK) Output Torque - Spring return [Nm]





OUTPUT TORQUE OF V E N U S PNEUMATIC ACTUATOR - SPRING RETURN(Unit:Nm)																	
Model	Spring Q.TY	Air pressure(Bar)														Springs' output	
		2.5		3		4		5		6		7		8			
		0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	0°	90°	90°	0°
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
D52SR	5	5.7	3.8	7.6	5.7											6.2	4.3
	6	4.9	2.5	6.9	4.5	10.9	8.5									7.4	5.0
	7	4.0	1.3	6.0	3.3	9.8	7.3	14.0	10.4							8.6	5.9
	8			5.2	2.0	9.2	6.0	13.2	9.1	17.2	14.1					9.9	6.7
	9			4.3	0.8	8.3	4.8	12.3	7.9	16.3	12.8	20.3	16.8			11.1	7.6
	10					7.4	3.6	11.5	6.7	15.5	11.6	19.5	15.6			12.4	8.5
	11					6.6	2.3	10.6	5.4	14.6	10.4	18.6	14.3	22.6	18.3	13.6	9.3
	12							9.7	4.2	13.8	9.1	17.8	12.2	21.8	17.1	14.8	10.2
D63SR	5	11.4	7.7	15.0	11.4	22.3	14.9									10.4	6.8
	6	10.1	5.7	13.6	9.3	20.9	16.6	28.3	23.9							12.5	8.2
	7	8.6	3.6	12.5	7.2	19.5	14.5	26.8	21.9							14.6	9.6
	8			10.9	5.1	18.2	12.4	25.5	19.8	32.8	27.0	40.1	34.3			16.7	10.9
	9					16.8	10.4	24.1	17.7	31.4	24.9	38.7	32.2			18.8	12.3
	10					1.4	8.2	22.8	15.6	30.0	22.8	37.3	30.1	44.7	37.4	20.9	13.7
	11							21.5	13.5	28.7	20.7	36.0	28.0	43.3	35.3	22.9	15.0
	12							20.0	11.4	27.3	18.6	34.6	25.9	41.9	33.3	25.0	16.4

2.2 (DK) Moment - enkeltvirkende fjeder retur [Nm]
2.2 (UK) Output Torque - Spring return [Nm]

OUTPUT TORQUE OF C SERIES PNEUMATIC ACTUATOR WITH SPRING RETURN(Unit:Nm)

Model	Spring Q.TY	Air pressure(Bar) 2.5		3		4		5		6		7		8		Springs' output	
		0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	90° Start	0° End
D75SR	5	14.5	10.6	19.4	15.5	29.5	25.7									14.5	10.5
	6	12.4	7.6	17.3	12.6	27.4	22.7	37.5	32.8							17.4	12.7
	7	10.4	4.8	15.2	9.7	25.3	19.9	35.4	29.9							20.3	14.8
	8			13.1	6.8	23.1	16.9	33.3	27.0	43.2	37.0	53.3	47.0			23.2	16.9
	9					21.0	14.1	31.2	24.1	41.1	34.1	51.2	44.2			26.1	19.0
	10					19.0	11.1	28.8	21.2	39.0	31.2	49.1	41.2	59.1	51.2	29.0	21.1
	11							27.0	18.3	37.0	28.3	47.0	38.4	57.0	48.4	31.9	23.2
	12							24.9	15.4	34.9	25.4	44.9	35.4	54.9	45.4	34.7	25.3
D83SR	5	23.3	16.1	31.1	24.0	46.8	39.7									23.0	15.8
	6	20.1	11.5	28.0	19.3	43.7	35.1	59.4	50.7							27.6	19.0
	7	17.0	6.9	24.8	14.8	40.5	30.5	56.2	46.2							32.2	22.1
	8			21.7	10.1	37.4	25.8	53.1	41.5	68.8	57.2	84.5	72.9			36.8	25.3
	9					34.2	21.3	49.9	37.0	65.6	52.6	81.2	68.3			41.4	28.5
	10					31.0	16.6	46.7	32.3	62.4	48.0	78.1	63.7	93.8	79.3	46.0	31.6
	11							43.6	27.7	59.3	43.4	75.0	59.1	90.6	74.8	50.6	34.8
	12							40.4	23.2	56.1	38.9	71.7	54.5	87.4	70.2	55.2	38.0
D92SR	5	33.1	22.0	44.2	33.2	66.8	55.9									34.4	23.3
	6	28.4	15.2	39.6	26.4	62.2	49.0	84.8	71.6							41.2	28.0
	7	23.8	8.2	34.9	19.4	57.5	42.1	80.2	64.7							48.1	32.7
	8			31.3	12.6	52.9	35.2	75.5	57.9	98.1	80.5	120.7	103.0			55.0	37.3
	9					48.2	28.4	70.9	51.0	93.5	73.6	116.0	96.1			61.9	42.0
	10					43.6	21.5	66.2	44.1	88.8	66.7	111.3	89.2	134.0	111.8	68.7	46.7
	11							61.5	37.2	84.1	59.9	106.6	82.4	129.2	105.0	75.6	51.4
	12							56.8	30.4	79.4	53.0	101.9	75.5	124.5	98.1	82.5	56.0
D105SR	5	51.0	33.4	67.5	49.9	100.6	83.0									49.2	31.6
	6	44.7	23.5	61.1	40.0	94.2	73.2	127.3	106.2							59.1	38.0
	7	38.4	13.7	54.9	30.3	87.9	63.4	121.0	96.4							68.9	44.3
	8			48.5	20.4	81.6	53.5	114.7	86.5	147.7	119.6	180.8	152.7			78.7	50.6
	9					75.3	43.7	108.4	76.8	141.5	109.8	174.5	142.9			88.6	56.9
	10					68.9	33.4	102.0	66.5	135.1	99.6	168.2	132.6	201.2	165.7	98.4	63.3
	11							95.7	57.0	128.7	90.1	161.8	123.1	194.8	156.2	108.3	69.6
	12							89.4	47.5	122.5	80.6	155.5	113.6	188.6	146.7	118.1	75.9
D125SR	5	73	47	98	72	148	122									79	52
	6	63	31	88	56	138	107	188	157							94	63
	7	52	15	77	40	127	90	178	141							110	73
	8			67	25	117	75	167	125	217	176	268	226			125	84
	9					107	59	157	109	207	159	257	210			141	94
	10					96	44	146	94	196	144	247	194	297	245	157	105
	11							136	78	186	128	236	178	286	228	173	115
	12							125	63	176	113	226	163	276	213	188	125
D140SR	5	128	85	171	127	256	213									129	86
	6	111	59	154	102	239	187	325	273							155	103
	7	94	33	137	76	222	162	308	247							181	120
	8			120	50	205	136	291	221	376	307	462	392			206	137
	9					187	110	273	196	358	281	444	367			232	155
	10					170	84	256	169	341	255	427	340	512	426	258	172
	11							238	143	324	229	409	314	495	400	284	189
	12							221	118	307	203	392	289	478	374	310	206
D160SR	5	193	124	259	191	392	324									208	140
	6	165	83	232	149	365	282	498	415							250	168
	7	137	41	203	107	336	240	469	373							292	196
	8			176	66	309	199	442	237	575	465	708	598			333	223
	9					280	157	413	290	546	423	679	556			375	251
	10					253	115	386	248	519	381	652	514	785	647	417	279
	11							358	207	491	340	624	473	757	606	458	307
	12							330	165	463	298	596	431	729	564	500	335
D190SR	5	332	222	438	329	651	542									309	200
	6	292	161	398	267	611	480	824	693							371	240
	7	252	99	358	205	571	418	784	631							433	280
	8			318	143	531	356	744	569	957	782	1169	995			495	320
	9					491	295	704	507	917	720	1130	933			557	360
	10					451	233	664	446	877	658	1090	871	1302	1084	618	400
	11							624	384	837	597	1050	809	1263	1022	680	440
	12							584	322	797	535	1010	748	1223	960	742	480
D210SR	5	390	285	523	418	789	684									380	275
	6	335	209	468	342	734	608	1000	874							456	330
	7	280	133	413	266	679	532	945	798							532	385
	8			358	190	624	456	890	722	1156	988	1422	1254			608	440
	9					569	380	835	646	1101	912	1367	1178			684	495
	10					514	304	780	570	1046	836	1312	1102	1578	1368	760	550
	11							725	494	991	760	1257	1026	1523	1292	836	605
	12							670	418	936	684	1202	950	1468	1216	912	660

2.2 (DK) Moment - enkeltvirkende fjeder retur [Nm]
2.2 (UK) Output Torque - Spring return [Nm]

OUTPUT TORQUE OF C SERIES PNEUMATIC ACTUATOR WITH SPRING RETURN(Unit:Nm)

Model	Spring Q.TY	Air pressure(Bar) 2.5		3		4		5		6		7		8		Springs' output	
		0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	0° Start	90° End	90° Start	0° End
D240SR	5	552	409	744	600	1129	985									554	410
	6	470	297	662	489	1047	874	1432	1259							665	492
	7	388	187	580	379	964	764	1349	1149							775	575
	8			498	268	883	653	1267	1037	1652	1422	2037	1807			886	656
	9					800	542	1185	926	1569	1311	1954	1696			998	739
	10					718	431	1103	816	1488	1201	1872	1586	2257	1970	1108	821
	11							1021	705	1406	1090	1791	1474	2176	1859	1219	903
	12							939	594	1323	979	1708	1363	2093	1748	1330	985
D270SR	5	903	675	1195	968	1779	1552									787	560
	6	790	519	1083	811	1667	1396	2252	1981							943	672
	7	679	361	972	654	1556	1238	2141	1823							1101	783
	8			860	497	1444	1081	2029	1666	2614	2252	3199	2836			1258	895
	9					1332	923	1917	1509	2502	2094	3087	2678			1416	1007
	10					1220	767	1805	1352	2390	1937	2974	2521	3560	3107	1572	1119
	11							1693	1194	2278	1779	2862	2364	3448	2949	1730	1231
	12							1582	1037	2167	1623	2751	2207	3336	2792	1887	1342
D300SR	5	1097	729													1061	730
	6	935	494	1316	875											1273	876
	7	772	258	1153	639	1916	1402									1485	1022
	8			991	403	1754	1166	2517	1929							1697	1168
	9					1592	930	2355	1693	3118	2456					1909	1314
	10					1430	695	2193	1458	2956	2221	3719	2984	4482	3747	2122	1460
	11							2030	1222	2793	1985	3556	2748	4319	3511	2334	1606
	12							1868	986	2631	1749	3394	2512	4157	3275	2546	1752
D350SR	5	1533	964													1702	1173
	6	1292	586	1863	1157											2043	1408
	7	1031	208	1602	779	2745	1922									2383	1640
	8			1341	401	2484	1544	3626	2686							2724	1877
	9					2224	1165	3366	2307	4508	3449					3064	2112
	10					1963	787	3105	1929	4247	3071	5390	4214	6532	5356	3405	2346
	11							2844	1551	3986	2693	5129	3836	6271	4978	3745	2581
	12							2584	1172	3726	2314	4869	3457	6011	4599	4086	2816

3.0 (DK) Driftsbetingelser
3.0 (UK) Operating conditions

(DK)

Medie:	Tørret trykluft eller ikke korrosive gasser, med dugpunkt mindst 10°C under laveste omgivelsestemperatur.
Kvalitet:	DIN/ISO 8573-1 Class3, maks 5µ
Forsyningstryk:	2,5 til 10 bar
Temperatur:	NBR -20°C til +80°C FKM -15°C til +150°C Silikone -35°C til +80°C
Justering:	+/-5° ved 0° og 90°
Montage:	Indendørs/udendørs

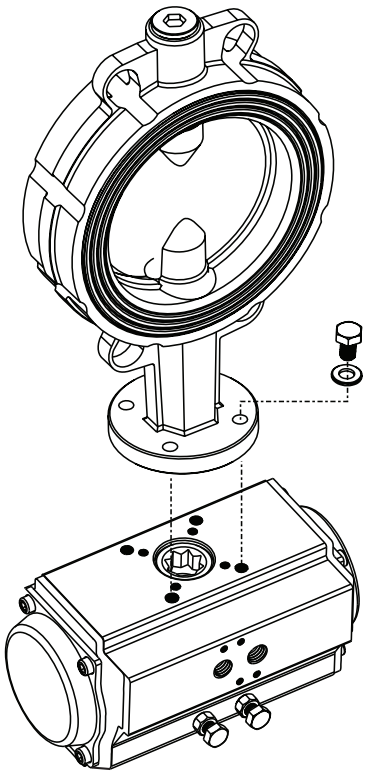
(UK)

Medie:	Dry pressurized air or non corossive gases with dewpoint minimum 10° below ambient temperatureKvalitet:
Quality:	DIN/ISO 8573-1 Class3, max. 5µ
Supply pressure:	2,5 to 10 bar
Temperature:	NBR -20°C to +80°C FKM -15°C to +150°C Silikone -35°C to +80°C
Adjustment:	+/-5° ved 0° og 90°
Installation:	Indoor/outdoor

4.0 (DK) Installation
4.0 (UK) Installation

(DK) VENUS pneumatiske aktuatorer har dobbelt firkant „stjernebund" og montage huller jfr. ISO5211 standarder. „Stjernebunden" gør at aktuatoren kan monteres på ventiler med parallel eller 45° skråtstillet spindel. Aktuatorerne kan monteres enten parallelt med eller vinkelret på rørstrengen.
1. Montér ventilens firkantede spindel i aktuatorens stjerneformede bund.
2. Skru ventilen og aktuatoren sammen vha. skruerne i ISO-hullerne.
3. Hvis nødvendigt kan justerboltene for åbne- og lukkeposition indstilles ved afprøvning med luft.

Følgende bør bemærkes inden aktuatoren monteres på ventilen:
- Kontroller om sammenbygningen skal være NC (normally closed) eller NO (normally open).
- Kontroller at ventil og aktuator er i samme position (enten åben eller lukket)
- Kontroller alle elementernes placering (ventil, aktuator, evt. kobling og beslag).
- Montér alle sammenbygningens elementer og vær omhyggelig med at krydsspænde boltene.
- Kontroller at positionsindikatoren er korrekt justeret og viser den korrekte position.



KLEMININGS-FARE!!!: Indsæt aldrig fingre, hænder eller andre legmesdele i ventilen under test af aktuatoren med trykluft.

(UK) Pneumatic actuators are fitted with a double square "star" pattern drive shaft and a mounting bolt pattern conforming to ISO 5211 Standards. This allows the actuator to be fitted to valves in increments of 90°, allowing mounting alignment either in-line or across the line of the pipe work, enabling the most efficient use of space without the position affecting the actuators basic operation.

1. Fit the square of the valve directly into the square of the actuator.
2. Bolt together through the valve ISO pad.
3. If necessary adjust the rotation angel of open and closed position by testing the assembly with pressurized air.

Following should be noted prior to assembly to valves:
- Determine the desired operation of the assembly, Normally closed valve NC, or Normally open NO.
- Check that valve and actuator are in the same position (open or closed).
- Check the correct positioning (alignment) of all the elements of the group,valve, connection piece, bracket and actuator.
- Assemble ensuring the mounting screws correctly distribute the effort inproportionally.
- Ensure all position indicators are correctly adjusted and show the correct position.
- If necessary adjust the rotation angel of open and closed position by testing the assembly with pressurized air.

DANGER!!!: Never insert fingers, hand or other parts into the valves during testing with pressurized air.

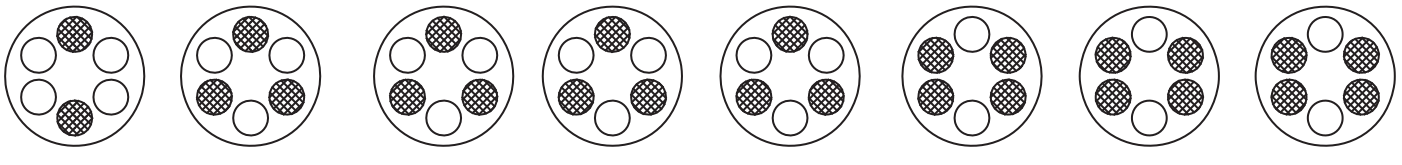
4.1 (DK) Ændring af fjedrepakker
4.1 (UK) Spring mounting form

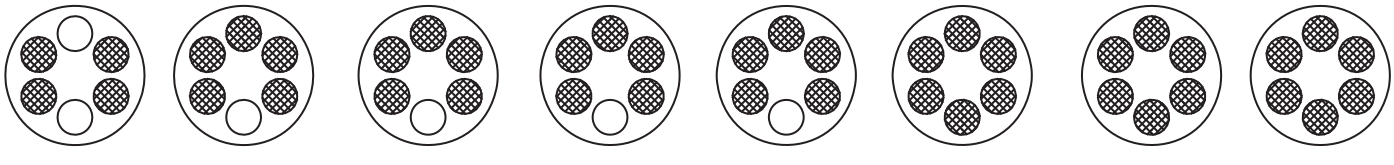
(DK) VENUS pneumatiske aktuatorer leveres som udgangspunkt med "fuld" fjederpakke på 12stk fjedre (2 x 6stk). Det er dog muligt at ændre bestykningen af fjeder i henhold til anvisningenre herunder.

FARE: Søg altid for at aktuatoren er gjort trykløs og forsyningen afmonteret inden endedækslerne løsnes. Fjedrene moneteres lettes med aktuatoren i vertikal position.

(UK) VENUS pneumatic actuators are standard delivered with "full" spring package 12pcs. (2 x 6pcs.). It is possible to change the spring configuration according to below picture.

DANGER: Always de-pressurize the actuator and disconnect the supply before loosening the end caps. Springs have to be mounted with the actuator in vertical position.





4.2 (DK) Justering af stopbolte
4.2 (UK) Adjustment of stop bolts

(DK)
Normal rotationsretning mod uret: Justering bør fortages uden styreluft.

Justering af ventilens lukkeposition gøres ved at ændre på højre justeringsbolt. Løsn kontramøtrikken inden bolten justeres. Hvis bolten skrues udad lukker ventilen mere. Hvis bolten skrues indad lukkes ventilen mindre. Efterspænd kontrmøtrikken når justeringen er foretaget.

Justering af ventilens åbneposition gøres ved at ændre på venstre justeringsbolt. Løsn kontramøtrikken inden bolten justeres. Hvis bolten skrues udad åbnerventilen mere. Hvis bolten skrues indad åbnes ventilen mindre. Efterspænd kontrmøtrikken når justeringen er foretaget.

(UK)
Normal rotation counter clockwise: Please adjust without air-pressure.

Adjustment of valve closing position is done by right side adjustment bolt. Loosen counter nut before bolt is adjusted. If the bolt is turned outwards the valve closes more. If the bolt is turned inwards the valve closes less.

Adjustment of valve opening position is done by left side adjustment bolt. Loosen counter nut before bolt is adjusted. If the bolt is turned outwards the valve opens more. If the bolt is turned inwards the valve opens less.

5.0 (DK) Vedligehold
5.0 (UK) Maintenance

(DK)
1. Venligst kontroller, med jævne mellemrum, at alle bolte i aktuatoren er spændt.
2. Aktuatoren leveres levtidssmurt. Under normale omstændigheder skal aktuatoren ikke eftersmøres.
3. Under visse driftsbetingelser (heavy duty drift, med andre gasarter end luft eller anden unormal drift) kan de indvendig o-ringe trænge til udskiftning.
4. For fjederretur aktuatorer bør fjedrepakken kontrolleres og om nødvendigt udskiftes efter 500.000 slag. Fjedrepakken bør altid udskiftes komplet.

KONTAKT: Ved spørgsmål kontakt **MODU Valves A/S**

(UK)
1. It is recommended that periodic checks be performed to make sure that all fasteners remain tight.
2. The actuator is supplied pre lubricated no further lubrication is required during normal life span.
3. Under certain working conditions (heavy duty, non-compatible operating media or abnormal operating conditions)internal seals should be checked periodically and replaced when necessary.
4. For spring return actuators please check and replace after 500.000 strokes spring should always be replaced in full sets.

KONTAKT: If any questions please contact **MODU Valves A/S**

6.0 (DK) Opbevaring og håndtering
6.0 (UK) Storage and handling

(DK)
Opbevaring) Sørg for at aktuatoren er helt tør og fri for vand. Forsegl styrelufttrykshullerne med de originale eller erstatnings plastik propper. Beskyt aktuatoren mod skidt, snavs og beskadigelse ved at pakke den i kasse eller plastikpose.

Håndtering) VENUS pneumatiske aktuatorer kan løftes og monteres i størrelserne 32 til 160, for størrelserne større end 190, er aktuatorene forsynet med løsfteøjer, der bør anvendes sammen med egnet løfteudstyr af sikkerhedsmæssige årsager. Løfteøjerne er kun beregnet til at løfte aktuatorens vægt og ikke en komplet sammenbygning. Brug da rundsling omkring aktuatoren eller ventilen istedet.

(UK)
Storage) Make sure the actuator is completely dry and free of water. Seal the control air pressure holes with the original or replacement plastic plugs. Protect the actuator from dirt, dust and damage by packing it in a box or plastic bag.

Handling) VENUS pneumatic actuators can be lifted and mounted in sizes 32 to 160, for sizes larger than 190, the actuators are equipped with lifting eyes. Suitable lifting equipment should be used to avoid damage. The lifting eyes are only intended to lift the weight of the actuator and not a complete assembly. Then use a loop around the actuator or valve instead.

Dobbeltvirkende Double acting	**Vægt [kg] Weight [kg]**	**Enkelttvirkende Spring return**	**Vægt [kg] Weight [kg]**
VENUS-32DA	0.7		
VENUS-40DA	0.8		
VENUS-52DA	1.4	VENUS-52SR	1.5
VENUS-63DA	2.0	VENUS-63SR	2.2
VENUS-75DA	2.7	VENUS-75SR	2.9
VENUS-83DA	3.1	VENUS-83SR	3.6
VENUS-92DA	4.6	VENUS-92SR	5.5
VENUS-105DA	6.8	VENUS-105SR	7.8
VENUS-125DA	8.9	VENUS-125SR	10,4
VENUS-140DA	13.3	VENUS-140SR	14,4
VENUS-160DA	20.1	VENUS-160SR	23.3
VENUS-190DA*	31.3	VENUS-190SR*	46.1
VENUS-210DA*	46.8	VENUS-210SR*	53.2
VENUS-240DA*	67.3	VENUS-240SR*	73.3
VENUS-270DA*	96.9	VENUS-270SR*	115.9
VENUS-300DA*	128.5	VENUS-300SR*	156.1
VENUS-350DA*	210.2	VENUS-350SR*	259.4
* Med løfteøjer montert / with lifting eyes mounted