

### Construction

The pneumatic DR/SC quarter turn actuators operate according to the double piston rack and pinion principle. Double acting or single acting versions are available.

### Features

- DR/SC quarter turn actuators are particularly suitable for mounting to butterfly valves or ball valves with a standard connection ISO 5211. DIN 3337 (F03 - F25)
- VDI/VDE 3845 connections (sizes 0 - 4) for mounting accessories and NAMUR control air connections are available

### Advantages

#### • Housing

**Version A:** The aluminium housing is completely ALODUR coated inside and outside. ALODUR coating features:

- extremely abrasion resistant
- smooth surface (therefore less abrasion at the dynamic components)
- optimum corrosion resistance

**Version D:** The housing is hard anodized inside and outside and PTFE coated to a thickness of 25-30 µm.

The end caps are chromated and also PTFE coated to a thickness of 80-90 µm. This coating is suitable for use with acid or chemical solutions (electro-plating or offshore).

#### • Multifunction indicator

The position of the multifunction indicator can be quickly adapted for a parallel or 45° position indicator as well as for actuator positions mounted along or across the pipe. By exchanging the yellow plastic inserts for metal inserts (Eisamet) the multifunction indicator is suitable as a "trigger cam" for external mounting of proximity sensors (without housing) type F25 from P + F. Other externally Mounted proximity sensors (without housing) on request.



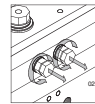
#### • Shaft connection

The octagonal shape offers the user more flexibility when mounting actuators. They can be mounted to valves with a parallel or diagonal square. All other shaft connections to EN ISO 5211 are possible on request.

#### • Stroke adjustment

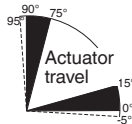
When mounting the actuator to the valve a lot of time can be saved using the precise cam system for adjusting both end positions  $\pm 20^\circ$ .

All end position adjustments are service friendly without disassembling the actuator.



#### • Temperature range

The temperature range of use of the actuators is  $-40^\circ\text{C}$  to  $+80^\circ\text{C}$ .



**Technical data**
**Control medium**

Filtered, dry compressed air, non-corrosive medium

**Control pressure**

6 - 8 bar

**Temperature range**

-40 °C to +80 °C, other temperatures on request

**Travel range**

20° adjustable (75°-95°)

90°

**Double acting actuators**

Type key	Actuator code	Actuator code Plastic butterfly valve	EN ISO 5211		
			Flange type	Shaft connection	Wrench size
DR0015U F04NS11AA	DU01AO0		F04	S	11
DR0030U F05F07NS14A	DU03AP0		F05/F07	S	14
DR0060U F05F07NS17A	DU06AC0	D006	F05/F07	S	17
DR0100U F05F07NS17A	DU10AC0	D010	F05/F07	S	17
DR0150U F07F10NS22A	DU15AD0	D015	F07/F10	S	22
DR0220U F07F10NS22A	DU22AD0		F07/F10	S	22
DR0300U F07F10NS22A	DU30AD0	D030	F07/F10	S	22
DR0450U F10F12NS27A	DU45AG0	D045	F10/F12	S	27
DR0600U F10F12NS27A	DU60AG0		F10/F12	S	27
DR0900U F10F12NS27A	DU90AG0		F12	S	27
DR0900U F14NS36A	DU90AK0		F14	S	36
DR1200U F10F12NS27A	D12UAG0		F10/F12	S	27
DR1200U F14NS36A	D12UAK0		F14	S	36
DR2000U F12ND27A	D20UAV0		F12	D	27
DR2000U F14NS36A	D20UAK0		F14	S	36
DR2000U F16NS46A	D20UAL0		F16	S	46

**Single acting actuators (control pressure 6 bar)**

SC0015U 6 F04NS11A	SU01K00		F04	S	11
SC0030U 6 F05F07NS14A	SU03KP0		F05/F07	S	14
SC0030U 6 F04NS11A	SU03K00		F04	S	11
SC0060U 6 F05F07NS14A	SU06KP0		F05/F07	S	14
SC0100U 6 F05F07NS17A	SU10KC0	S010	F05/F07	S	17
SC0150U 6 F05F07NS17A	SU15KC0		F05/F07	S	17
SC0220U 6 F07F10NS22A	SU22KD0	S022	F07/F10	S	22
SC0300U 6 F07F10NS22A	SU30KD0	S030	F07/F10	S	22
SC0450U 6 F10F12NS27A	SU45KG0	S045	F10/F12	S	27
SC0600U 6 F10F12NS27A	SU60KG0		F10/F12	S	27
SC0900U 6 F10F12NS27A	SU90KG0	S090	F10/F12	S	27
SC1200U 6 F10F12NS27A	S12UKG0	S120	F10/F12	S	27
SC2000U 6 F14NS36A	S20UKK0		F14	S	36
SC2000U 6 F16NS46A	S20UKL0		F16	S	46
SC2000U 6 F12NS27A	S20UKQ0		F12	S	27
SC3000U 6 F14NS36A	S30UKK0		F14	S	36
SC3000U 6 F12ND27A	S30UKV0		F12	D	27
SC4000U 6 F16NS46A	S40UKQ0		F16	S	46
SC5000U 6 F16F25NS46A	S50UKS0		F16/F25	S	46

Other actuator sizes and flange designs on request

Actuators with shaft connection "S" can be mounted to valves with a parallel "L" and diagonal "D" square

**Choice of housing coatings**

Type	Components and coating				Suitable for
	Housing	End cap	Shaft	Piston	
<b>A</b> (Standard)	ALODUR	Chromatized + Polyester coated	Chemically nickel-plated ENP	Anodized	General industry
<b>D</b> (Option)	ALODUR + PTFE coating	Chromatized + PTFE coated	Chemically nickel-plated ENP	Anodized	Corrosive environment. acid or chemical solutions





Torque ratings for double acting actuators [Nm]											
DR	Control pressure										
	2.5 bar	3 bar	3.5 bar	4 bar	4.2 bar	4.5 bar	5 bar	5.5 bar	6* bar	7 bar	8 bar
0015U	8.3	10.0	11.6	13.3	14.0	15.0	16.6	18.3	19.9	23.3	26.6
0030U	14.7	18.0	20.5	23.5	25.0	26.0	29.3	32.0	35.2	41.0	46.9
0060U	29.1	35.0	40.7	46.5	49.0	52.0	58.2	64.0	69.8	81.4	93.1
0100U	46.0	55.0	64.0	73.0	77.0	82.0	92.0	101.0	110.0	128.0	146.0
0150U	66.5	80.0	93.1	106.0	112.0	120.0	133.0	146.0	160.0	186.0	213.0
0220U	107.0	129.0	150.0	172.0	181.0	193.0	215.0	236.0	258.0	301.0	344.0
0300U	138.0	166.0	194.0	222.0	233.0	249.0	277.0	305.0	332.0	388.0	443.0
0450U	217.0	261.0	304.0	348.0	365.0	391.0	435.0	478.0	522.0	609.0	696.0
0600U	284.0	340.0	397.0	454.0	477.0	511.0	567.0	624.0	681.0	794.0	908.0
0900U	383.0	459.0	536.0	613.0	643.0	689.0	766.0	842.0	919.0	1072.0	1225.0
1200U	532.0	638.0	745.0	851.0	893.0	957.0	1064.0	1170.0	1276.0	1489.0	1702.0
2000U	893.0	1072.0	1251.0	1430.0	1501.0	1608.0	1787.0	1966.0	2144.0	2502.0	2859.0
3000U	1297.0	1556.0	1815.0	2075.0	2179.0	2334.0	2594.0	2853.0	3112.0	3631.0	4150.0
4000U	1795.0	2154.0	2513.0	2872.0	3015.0	3231.0	3590.0	3949.0	4308.0	5026.0	5744.0
5000U	2252.0	2703.0	3153.0	3604.0	3784.0	4054.0	4504.0	4955.0	5405.0	6306.0	-

\* GEMÜ - Standard

Air consumption [l / stroke]											
Actuator		Control pressure									
		2.5 bar	3 bar	3.5 bar	4 bar	4.5 bar	5 bar	5.5 bar	6 bar	7 bar	8 bar
0015U	DR	0.84	0.96	1.08	1.20	1.32	1.44	1.56	1.68	1.92	2.16
	SC	0.32	0.36	0.41	0.45	0.50	0.54	0.59	0.63	0.72	0.81
0030U	DR	1.47	1.68	1.89	2.10	2.31	2.52	2.73	2.94	3.36	3.78
	SC	0.56	0.64	0.72	0.80	0.88	0.96	1.04	1.12	1.28	1.44
0060U	DR	2.80	3.20	3.60	4.00	4.40	4.80	5.20	5.60	6.40	7.20
	SC	1.09	1.24	1.40	1.55	1.71	1.86	2.02	2.17	2.48	2.79
0100U	DR	4.52	5.16	5.81	6.45	7.10	7.74	8.39	9.03	10.32	11.61
	SC	1.79	2.04	2.30	2.55	2.81	3.06	3.32	3.57	4.08	4.59
0150U	DR	6.37	7.28	8.19	9.10	10.01	10.92	11.83	12.74	14.56	16.38
	SC	2.49	2.84	3.20	3.55	3.91	4.26	4.62	4.97	5.68	6.39
0220U	DR	10.47	11.96	13.46	14.95	16.45	17.94	19.44	20.93	23.92	26.91
	SC	4.17	4.76	4.76	5.95	6.55	7.14	7.74	8.33	9.52	9.52
0300U	DR	13.58	15.52	17.46	19.40	21.34	23.28	25.22	27.16	31.04	34.92
	SC	5.39	6.16	6.93	7.70	8.47	9.24	10.01	10.78	12.32	13.86
0450U	DR	21.67	24.76	27.86	30.95	34.05	37.14	40.24	43.33	49.52	55.71
	SC	8.44	9.64	10.85	12.05	13.26	14.46	15.67	16.87	19.28	21.69
0600U	DR	28.21	32.24	36.27	40.30	44.33	48.36	52.39	56.42	64.48	72.54
	SC	10.99	12.56	14.13	15.70	17.28	18.84	20.41	21.98	25.12	28.26
0900U	DR	39.03	44.60	50.18	55.75	61.33	66.90	72.48	78.05	89.20	100.35
	SC	14.91	17.04	19.17	21.30	23.43	25.56	27.69	29.82	34.08	38.34
1200U	DR	53.90	61.60	69.30	77.00	84.70	92.40	100.10	107.80	123.20	138.60
	SC	20.79	23.76	26.73	29.70	32.67	35.64	38.61	41.58	47.52	53.46
2000U	DR	88.20	100.80	113.40	126.00	138.60	151.20	163.80	176.40	201.60	226.80
	SC	35.00	40.00	45.00	50.00	55.00	60.00	65.00	70.00	80.00	90.00
3000U	DR	125.58	143.52	161.46	179.40	197.34	215.28	233.22	251.16	287.04	322.92
	SC	50.75	58.00	65.25	72.50	79.75	87.00	94.25	101.50	116.00	130.50
4000U	DR	185.50	212.00	238.50	265.00	291.50	318.00	344.50	371.00	424.00	477.00
	SC	70.00	80.00	90.00	100.00	110.00	120.00	130.00	140.00	160.00	180.00
5000U	DR	227.50	260.00	292.50	325.00	357.50	390.00	422.50	455.00	520.00	585.00
	SC	87.50	100.00	112.50	125.00	137.50	150.00	162.50	175.00	200.00	225.00

**Order data**

Type	Code
Double acting, clockwise rotation	DR
Double acting, anticlockwise rotation	DL
Single acting, spring closing	SC
Single acting, spring opening	SO

Location spigot	Code
Without location spigot	N
With location spigot	Y

**Actuator size**  
(Standard torque ratings at 6 bar control pressure)

DR/DL	SC	SO	Code
19.9	7.9	12.8	0015U
35.2	13.3	20.2	0030U
69.8	26.5	41.5	0060U
110.0	44	69.3	0100U
160.0	60.8	94.5	0150U
258.0	98.4	157	0220U
332.0	126	198	0300U
522.0	198	309	0450U
681.0	269	399	0600U
919.0	379	568	0900U
1276.0	510	756	1200U
2144.0	865	1251	2000U
3112.0	1309	1922	3000U
4308.0	1754	2620	4000U
5405.0	2207	2971	5000U

Coupling	Code
Diagonal square	D
Parallel square	L
Double flats	H
Single keyway	V
Star (double square) - standard	S

Wrench size	Code
Wrench size SW	11 - 55
see table page 2	

Coating	Code
Alodur - Standard	A
Alodur + PTFE coating	D

Stroke limiter	Code
Without	-
Stroke limiter 0-100%	H

Springs/Side (F/S)	Code
Double acting	-
Single acting - correlation see table on pages 3/4	1 - 8

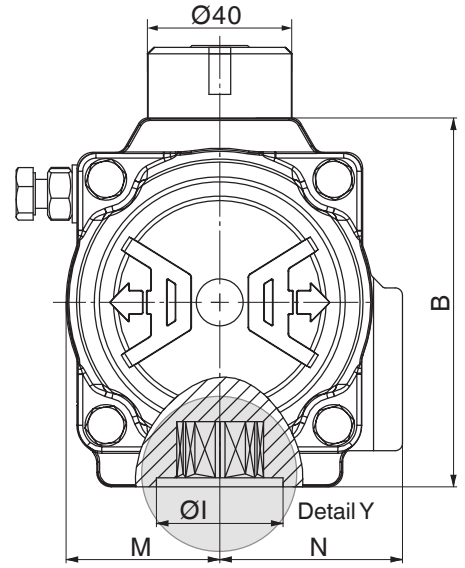
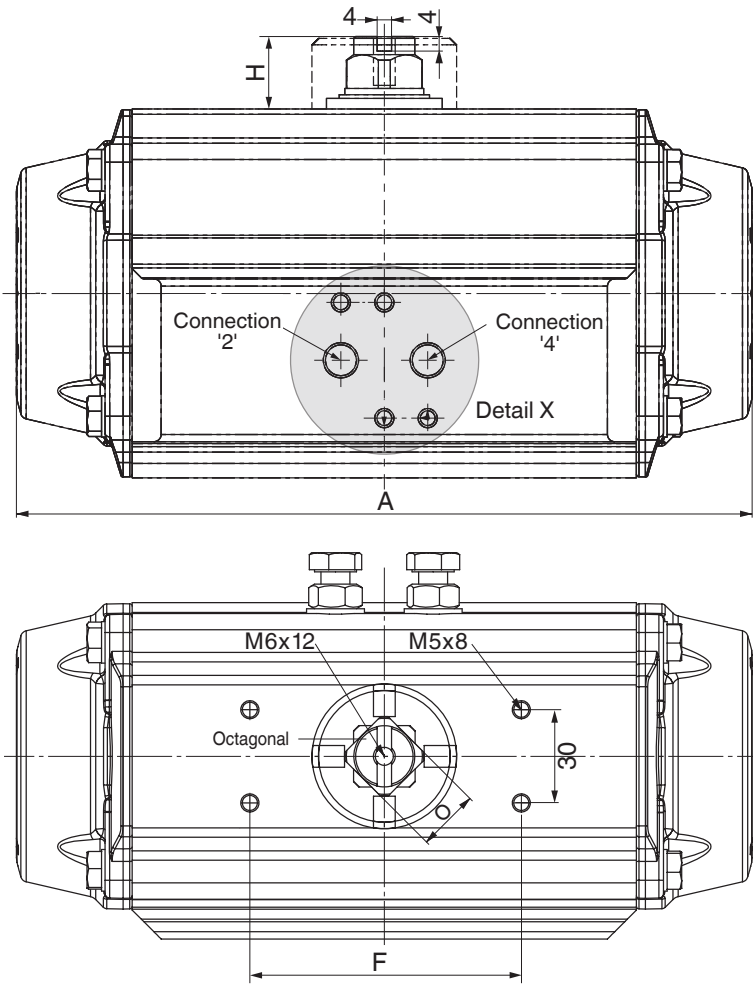
Special function	Code
Atex	X

Connection size	Code
Flange type F04	F04
Flange type F05/F07	F05/F07
Flange type F07/F10	F07/F10
Flange type F10/F12	F10/F12
Flange type F12	F12
Flange type F16	F16
Flange type F25	F25

Order example	SC	0060U	6	F04	N	S	11	A	-	-
Type	SC									
Actuator size (code)		0060U								
Springs/Side (code)			6							
Connection size (code)				F04						
Location spigot (code)					N					
Coupling (code)						S				
Wrench size (code)							11			
Coating (code)								A		
Stroke limiter (code)									-	
Special function (code)										-



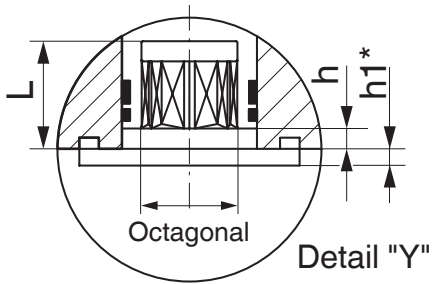
Actuator dimensions [mm]



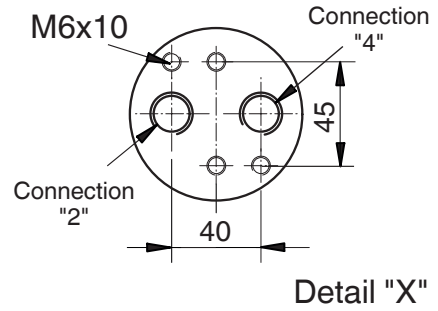
Detail "X" and "Y"  
see mounting dimensions

Type	0015U	0030U	0060U	0100U	0150U	0220U	0300U	0450U	0600U	0900U	1200U	2000U	3000U	4000U	5000U
ISO Flange	F04	F04/05	F05/07	F05/07	F07/10	F07/10	F07/10	F10/12	F10/12	F10/F14	F14	F16	F16	F16	F25
Octagonal	11	14	14	17	17	22	22	27	27	36	36	46	46	46	55
Air connector	G 1/8	G 1/8	G 1/8	G 1/8	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	G 3/8	G 1/2	G 1/2	G 1/2
<b>A</b>	136.0	153.5	203.5	241.0	259.0	304.0	333.0	394.5	422.5	474.0	528.0	605.0	710.0	812.0	876.0
<b>B</b>	69.0	85.0	102.0	115.0	127.0	145.0	157.0	177.0	196.0	220.5	245.0	298.5	330.0	383.0	410.0
<b>F</b>	80	80	80	80	80	80	80	80	80	130	130	130	130	130	130
<b>H</b>	20	20	20	20	20	30	30	30	30	50	50	50	50	50	50
<b>Ø I</b>	30	35	35	40	55	55	55	70	70	100	100	130	130	130	200
<b>M</b>	29.0	36.0	42.5	49.5	55.5	64.0	69.5	80.0	88.0	99.0	110.0	131.0	165.0	185.5	204.0
<b>N</b>	43.0	48.5	50.5	56.5	63.0	72.0	77.0	86.0	93.0	101.0	111.5	131.0	165.0	185.5	214.0
<b>O</b>	11	11	17	17	17	27	27	27	27	36	36	36	36	36	36
<b>S</b>	24	24	24	24	24	24	24	24	24	24	24	40	40	40	40
<b>h</b>	0.5	0.5	0.5	1.5	1.5	1.5	1.5	1.5	1.5	2	2	2.5	2.5	2.5	2.5
<b>Weight [kg]</b>															
<b>DR</b>	1.0	1.6	2.7	3.7	5.2	8.0	9.8	14.0	18.0	24.0	34.0	53.0	74.0	123.0	127.0
<b>SC</b>	1.1	1.7	3.1	4.3	6.1	9.3	12.0	17.0	22.0	33.0	42.0	67.0	93.0	155.0	169.0

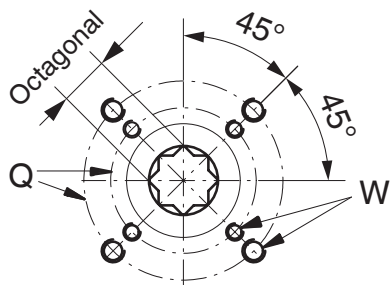
Mounting dimensions [mm]



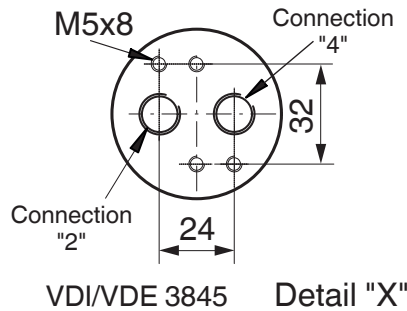
Type 2000U-4000U



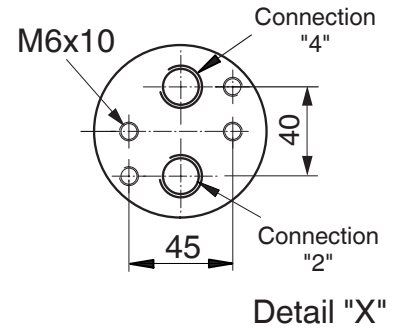
Bottom - ISO 5211



Type 0015U-1200U



Type 5000U

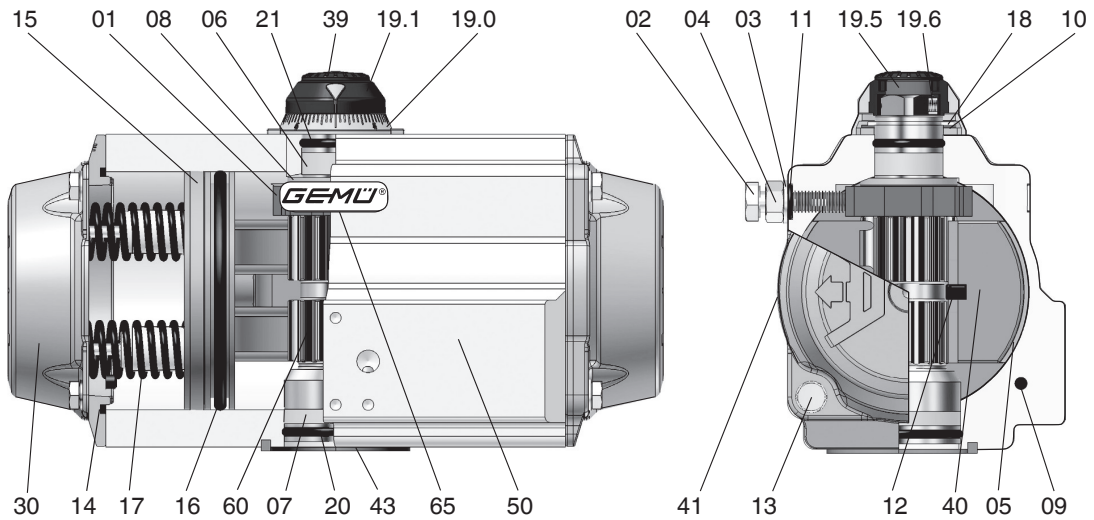


Type	0010U	0015U	0030U		0060U	0100U	0150U		0220U	0300U	0450U	0600U
ISO flange	F04	F04	F04	F05/07	F05/07	F05/07	F05/07	F07/10	F07/10	F07/10	F10/12	F10/12
Octagonal	11	11	11	14	14	17	17	22	22	22	27	27
Air connector	G 1/8	G 1/8	G 1/8		G 1/8	G 1/8	G 1/4		G 1/4	G 1/4	G 1/4	G 1/4
L	11	11	11	16	19	19	19		19	25	32	40
Q	42	42	42	50/70	50/70	50/70	50/70	70/102	70/102	70/102	70/102	70/102
W	M5	M5	M5	M6/M8	M6/M8	M6/M8	M6/M8	M8/M10	M8/M10	M8/M10	M10/M12	M10/M12
h1 max (*)	1.5	1.5	2	NA	2	1.5	2		2	2	3	3
h min	0.5	0.5	0.5	0.5	0.5	1.5	1.5		1.5	1.5	1.5	1.5

Type	0900U			1200U		2000U			3000U		4000U	5000U
ISO flange	F12	F14	F10/12	F10/12	F14	F12	F14	F16	F12	F14	F16	F16/25
Octagonal	27	36	27	37	36	27	36	46	27	36	46	46
Air connector	G 1/4			G 1/4		G 3/8			G 1/2		G 1/2	G 1/2
L	40	38	34	40	38	40	38	48	40	38	57	57
Q	150	175	70/102	70/102	175	102	175	210	150	175	210	210/300
W	M12	M16	M10/M12	M10/M12	M16	M12	M16	M20	M12	M16	M20	M20/M16
h1 max (*)	3			3		2.5			2.5		4	3.5
h min	2			2		1.5			1.5		2.5	2.5



Standard actuator



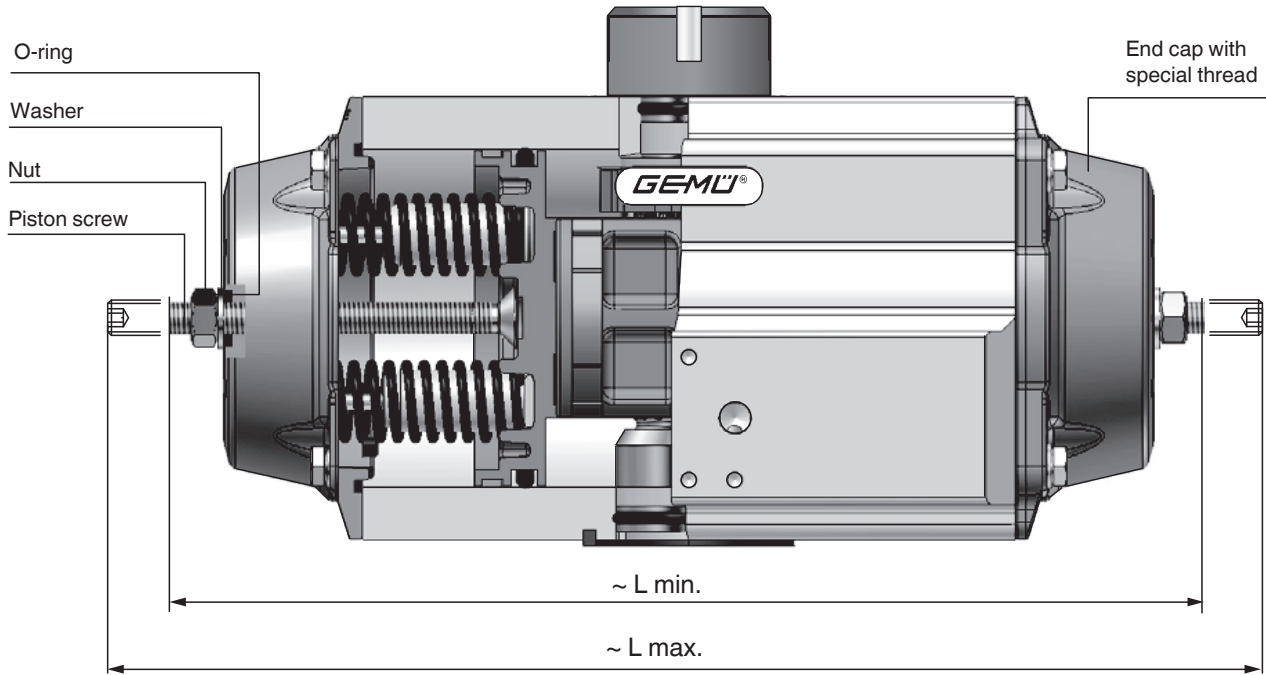
PART N°	UNIT Q.TY	PART DESCRIPTION	MATERIAL
01 <sup>1</sup>	1	OCTI-CAM (stroke adjustment)	Stainless steel (DRSC00060 to DRSC00150) Carbon steel, zinc coated (DRSC00220 to DRSC02000)
02	2	TRAVEL STOP SCREW	Stainless steel
03	2	WASHER	Stainless steel
04	2	NUT (travel stop screw)	Stainless steel
05*	2	BEARING (piston back)	PA46
06*	1	BEARING (pinion top )	High-grade polymer
07*	1	BEARING (pinion bottom)	High-grade polymer
08*	1	THRUST BEARING (pinion)	PA46
09*	2	PLUG (transfer port)	Silicone
10	1	THRUST WASHER (pinion)	Stainless steel
11*	2	O-RING (travel stop screw)	M-NBR
12	2	THRUST SHOULDER	PA66 + GF
13 <sup>2</sup>	8/12/16	CAP SCREW	Stainless steel
14*	2	O-RING (end cap)	M-NBR
15*	2	BEARING (piston head)	POM
16*	2	O-RING (piston)	M-NBR
17	min. 5 max. 12	SPRING (cartridge)	SiCr Epoxy coated spring steel alloy
18	1	SPRING CLIP (pinion)	Spring steel, ENP
19.0	1	GRADUATED RING	PA66+GF+CB
19.1	1	POSITION INDICATOR	PA66+GF+(CB)
19.5	1	SHAFT ADAPTOR	Extruded aluminium alloy, anodized
19.6	2	HEX. SOCKET SCREW (top adaptor)	Stainless steel
20*	1	O-RING (pinion bottom)	M-NBR
21*	1	O-RING (pinion top)	M-NBR
30 <sup>3</sup>	2	END CAP	Pressure die cast aluminium alloy, anodized and coated
39	1	SCREW (position indicator)	PA66+GF+CB
40	2	PISTON	Pressure die cast aluminium alloy, anodized
41	1	ACTUATOR IDENTIFICATION LABEL	Polyester-Silver
43	1	LOCATION SPIGOT (only on request)	Extruded aluminium alloy, anodized
50	1	HOUSING	Extruded aluminium alloy, coated
60	1	DRIVE SHAFT	Steel, ENP
60.1	1	INTEGRAL DRIVE SHAFT	Stainless steel, ENP
65	1	PLASTIC INSERT	PA66

\* Included in spare parts kit; type ES4G

<sup>1</sup> Type DR/SC 0220-5000; <sup>2</sup> 8 pcs. type DR/SC 0015-2000; 12 pcs. type DR/SC 3000;

<sup>3</sup> Type DR/SC 0600-3000 end caps are symmetric

Actuator with travel stop adjustment (stroke limiter)



Actuator with stroke adjustment (100%) dependent on travel range

DR/SC	0015U	0030U	0060U	0100U	0150U	0220U	0300U	0450U	0600U	0900U	1200U	2000U	3000U	4000U	5000U
L min (mm)	158	184	242	280	303	356	368	449	461	531	628	653	762	910	910
L max (mm)	186	216	286	330	359	424	444	537	555	631	739	785	918	1080	1086

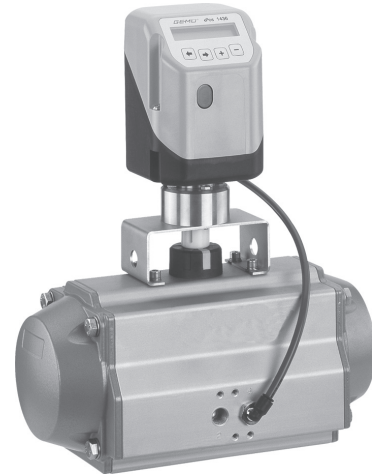
Type	Air volume (L)		Switching times* (Sec.) (A)				Weight [kg]	
	opening	closing	DR opening	DR closing	SC opening	SC closing	DR	SC
0015U	0.1	0.2	0.2	0.3	0.3	0.3	1.0	1.1
0030U	0.2	0.3	0.3	0.3	0.3	0.4	1.6	1.7
0060U	0.3	0.5	0.3	0.4	0.4	0.5	2.7	3.2
0100U	0.5	0.8	0.4	0.5	0.5	0.6	3.8	4.4
0150U	0.7	1.1	0.5	0.7	0.7	0.9	5.4	6.5
0220U	1.2	1.8	0.7	0.9	0.9	1.1	8.4	9.8
0300U	1.5	2.3	0.9	1.2	1.2	1.4	10.2	12.6
0450U	2.4	3.8	1.2	1.5	1.5	1.8	14.5	18.1
0600U	3.1	4.9	1.5	1.8	1.8	2.1	19.8	24.0
0900U	4.3	6.9	2.0	2.4	2.4	2.8	25.0	31.6
1200U	5.9	9.5	2.7	3.5	3.5	4.0	35.5	45.1
2000U	10.0	15.2	3.5	4.1	4.1	4.6	53.0	64.2
3000U	14.5	21.4	4.0	4.5	4.5	5.0	83.0	102.2
4000U	20.0	30.0	5.0	6.0	6.0	7.0	118.0	150.0
5000U	25.0	40.0	6.0	7.5	7.5	8.5	134.0	169.0

\* **Note: (A)** The above switching times of the actuator were determined under the following test conditions :  
 (1) room temperature, (2) travel range 90°, (3) solenoid valve with ø 4 mm and flow Qn 400L/min., (4) internal ø 8 mm.  
 (5) Medium: lubricated air, (6) air pressure 5.5 bar (79.95 Psi), (7) actuator without external stress.

**Attention :** The switching times may be different under different conditions of use.



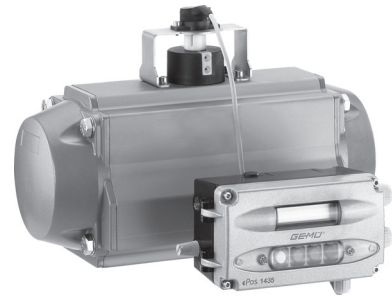
**GEMÜ 1436 cPos**  
Electro-pneumatic  
positioner and/or  
process controller



**GEMÜ SC 0150 + 1436 cPos**



**GEMÜ 1435 ePos**  
Electro-pneumatic  
positioner



**GEMÜ SC 0150 + 1435 ePos**



**GEMÜ 4221**  
Combi switchbox with  
integrated pilot valve



**GEMÜ SC 0100 + 4221**



**GEMÜ 1228**  
Electrical position  
indicator



**GEMÜ 8506**  
Solenoid Valve,  
Metal, NAMUR



**GEMÜ DP90**  
Throttle plate,  
NAMUR

Mounting examples



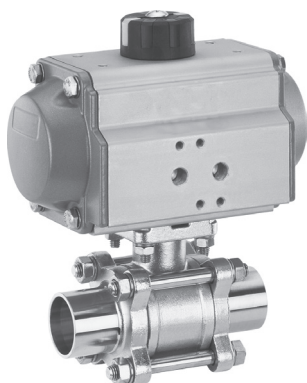
**GEMÜ 451**  
Wafer type butterfly valve,  
plastic



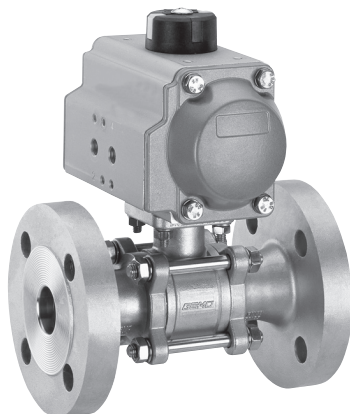
**GEMÜ 481/D481**  
Wafer type butterfly valve,  
metal



**GEMÜ 491**  
Wafer type butterfly valve,  
metal



**GEMÜ 741**  
Ball valve, metal



**GEMÜ 751**  
Ball valve, metal



**GEMÜ 761**  
Ball valve, metal

For further actuators, accessories and other products,  
please see our Product Range catalogue and Price List. Contact GEMÜ.

