4.2 TECHNICAL DATA - ball screw linear actuators UBA Series

SIZE				UBA 1	UBA 2	UBA 3	UBA 4	UBA 5
Push rod diameter			[mm]	25	30	35	40	50
Outer tube diameter			[mm]	36	45	55	60	70
Attachment flange for IEC standard motor				56 B14	63 B14	71 B14	80 B14 90 B14	80 B14 90 B14
Max. dynamic load.			[N]	1 800	3 400	3 900	5 700	10 850
Max. static load		pull	[N]	4 000	6 000	10 000	12 000	15 000
		push	[N]	4 000	6 000	10 000	12 000	15 000
Ratio			RV	1 : 1.33 (18 : 24)	1 : 1.4 (20 : 28)	1 : 1.04 (24 : 25)	1 : 1.07 (30 : 32)	1 : 1.07 (30 : 32)
			RN	1 : 2.15 (13 : 28)	1 : 2.13 (15 : 32)	1 : 2 (16 : 32)	1 : 1.94 (18 : 35)	1 : 1.94 (18 : 35)
			RL	1 : 3 (10 : 30)	1 : 2.83 (12 : 34)	1 : 2.92 (12 : 35)	1 : 2.93 (15 : 44)	1 : 2.93 (15 : 44)
Ball screw	Diameter × Lead			14×5	16×5	20×5	25×6	32×10
	Ball		[mm]	3.175 (1/8 “)	3.175 (1/8 “)	3.175 (1/8 “)	3.969 (5/32 “)	6.350 (1/4 “)
	N° of circuits			2	3	3	3	4
	Dynamic load C_a		[N]	6 600	10 400	12 000	17 400	41 800
	Static load C_{0a}		[N]	8 600	15 600	21 200	30 500	73 000
Linear travel [mm] for 1 input shaft revolution		Ratio	RV1	3.75	3.57	4.8	5.62	9.38
			RN1	2.32	2.34	2.5	3.09	5.14
			RL1	1.67	1.76	1.71	2.05	3.41
Ball screw	Diameter × Lead			14×10	16×10	20×10	25×10	32×20
	Ball		[mm]	3.175 (1/8 “)	3.175 (1/8 “)	3.175 (1/8 “)	3.969 (5/32 “)	6.350 (1/4 “)
	N° of circuits			2	3	3	3	3
	Dynamic load C_a		[N]	6 900	11 300	12 900	18 000	32 200
	Static load C_{0a}		[N]	9 300	18 000	23 500	33 000	53 000
Linear travel [mm] for 1 input shaft revolution		Ratio	RV2	7.5	7.14	9.6	9.38	18.75
			RN2	4.64	4.69	5	5.14	10.29
			RL2	3.33	3.53	3.43	3.41	6.82
Mass (actuator 100 mm stroke length, without motor, with lubricant)			[kg]	3.3	5	8	11	19
Extra-mass for each additional 100 mm stroke length			[kg]	0.3	0.5	0.8	0.9	2

Linear actuators UBA Series

BALL SCREW LINEAR ACTUATORS UBA Series with AC 3-PHASE MOTOR
PERFORMANCE with: Duty Cycle F_i = 100 % at ambient temperature 25 °C

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR: POWER [kW] — N° of POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
UBA 1				
350	290 1)	RV2	0.12 kW 2-pole 2800	0.72
215	460 1)	RN2	0.12 kW 2-pole 2800	0.72
175	570 1)	RV1	0.12 kW 2-pole 2800	0.72
155	650 1)	RL2	0.12 kW 2-pole 2800	0.72
105	950 1)	RN1	0.12 kW 2-pole 2800	0.72
85	800 1)	RV1	0.09 kW 4-pole 1400	0.72
75	1300 1)	RL1	0.12 kW 2-pole 2800	0.72
55	1300 1)	RN1	0.09 kW 4-pole 1400	0.72
40	1800 3)	RL1	0.09 kW 4-pole 1400	0.72
UBA 2				
330	600 1)	RV2	0.25 kW 2-pole 2800	0.71
220	900 1)	RN2	0.25 kW 2-pole 2800	0.71
165	1200 1)	RL2	0.25 kW 2-pole 2800	0.71
110	1850 1)	RN1	0.25 kW 2-pole 2800	0.71
80	2450 1)	RL1	0.25 kW 2-pole 2800	0.71
55	2550 1)	RN1	0.18 kW 4-pole 1400	0.71
40	3400 3)	RL1	0.18 kW 4-pole 1400	0.71
UBA 3				
450	960 1)	RV2	0.55 kW 2-pole 2800	0.70
235	1850 1)	RN2	0.55 kW 2-pole 2800	0.70
160	2700 1)	RL2	0.55 kW 2-pole 2800	0.70
115	2750 2)	RN1	0.55 kW 2-pole 2800	0.70
80	3550 1)	RL2	0.37 kW 4-pole 1400	0.70
60	3450 2)	RN1	0.37 kW 4-pole 1400	0.70
40	3900 2)	RL1	0.37 kW 4-pole 1400	0.70
UBA 4				
440	1950 1)	RV2	1.1 kW 2-pole 2800	0.70
240	3550 1)	RN2	1.1 kW 2-pole 2800	0.70
160	4700 2)	RL2	1.1 kW 2-pole 2800	0.70
120	4800 1)	RN2	0.75 kW 4-pole 1400	0.70
96	4500 2)	RL1	1.1 kW 2-pole 2800	0.70
80	5900 2)	RL2	0.75 kW 4-pole 1400	0.70
48	5700 2)	RL1	0.75 kW 4-pole 1400	0.70
UBA 5				
875	1300 1)	RV2	1.5 kW 2-pole 2800	0.70
480	2400 1)	RN2	1.5 kW 2-pole 2800	0.70
440	2650 1)	RV1	1.5 kW 2-pole 2800	0.70
320	3650 1)	RL2	1.5 kW 2-pole 2800	0.70
240	4800 1)	RN1	1.5 kW 2-pole 2800	0.70
160	7250 1)	RL1	1.5 kW 2-pole 2800	0.70
120	7050 1)	RN1	1.1 kW 4-pole 1400	0.70
80	10650 1)	RL1	1.1 kW 4-pole 1400	0.70

1) value limited by electric motor power; ball screw lifetime L_{10h} > 1000 hours (see diagrams on pages 33 ... 35)
The total dynamic efficiency (η) of UBA Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

$$\eta = \eta_1 \times \eta_2 \times \eta_3$$

where:
η_1 = 0.95 – timing belt transmission efficiency
η_2 = 0.9 – ball screw - nut efficiency
η_3 = 0.9 – bearings and sealing elements "efficiency"

2) value related to the ball screw lifetime L_{10h} = 1000 h, with constant load, without load vibrations nor shocks; for different lifetime refer to diagrams on pages 33 ... 35

3) limit value of linear actuator dynamic load capacity (see page 128)

Linear actuators UBA Series

BALL SCREW LINEAR ACTUATORS UBA Series with AC 1-PHASE MOTOR
PERFORMANCE with: Duty Cycle F_i = 100 % at ambient temperature 25 °C

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR: POWER [kW] — N° of POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
UBA 1				
350	250 [1]	RV2	0.12 kW 2-pole 2800	0.72
215	400 [1]	RN2	0.12 kW 2-pole 2800	0.72
175	500 [1]	RV1	0.12 kW 2-pole 2800	0.72
155	600 [1]	RL2	0.12 kW 2-pole 2800	0.72
105	850 [1]	RN1	0.12 kW 2-pole 2800	0.72
85	750 [1]	RV1	0.09 kW 4-pole 1400	0.72
75	1200 [1]	RL1	0.12 kW 2-pole 2800	0.72
55	1300 [1]	RN1	0.09 kW 4-pole 1400	0.72
40	1800 [3]	RL1	0.09 kW 4-pole 1400	0.72
UBA 2				
330	550 [1]	RV2	0.25 kW 2-pole 2800	0.71
220	850 [1]	RN2	0.25 kW 2-pole 2800	0.71
165	1100 [1]	RL2	0.25 kW 2-pole 2800	0.71
110	1650 [1]	RN1	0.25 kW 2-pole 2800	0.71
80	2300 [1]	RL1	0.25 kW 2-pole 2800	0.71
55	2550 [1]	RN1	0.18 kW 4-pole 1400	0.71
40	3400 [3]	RL1	0.18 kW 4-pole 1400	0.71
UBA 3				
450	960 [1]	RV2	0.55 kW 2-pole 2800	0.70
235	1850 [1]	RN2	0.55 kW 2-pole 2800	0.70
160	2700 [1]	RL2	0.55 kW 2-pole 2800	0.70
115	2750 [2]	RN1	0.55 kW 2-pole 2800	0.70
80	3550 [1]	RL2	0.37 kW 4-pole 1400	0.70
60	3450 [2]	RN1	0.37 kW 4-pole 1400	0.70
40	3900 [2]	RL1	0.37 kW 4-pole 1400	0.70
UBA 4				
440	1900 [1]	RV2	1.1 kW 2-pole 2800	0.70
240	3500 [1]	RN2	1.1 kW 2-pole 2800	0.70
160	4700 [2]	RL2	1.1 kW 2-pole 2800	0.70
120	4800 [1]	RN2	0.75 kW 4-pole 1400	0.70
96	4500 [2]	RL1	1.1 kW 2-pole 2800	0.70
80	5900 [2]	RL2	0.75 kW 4-pole 1400	0.70
48	5700 [2]	RL1	0.75 kW 4-pole 1400	0.70

[1] value limited by electric motor power; ball screw lifetime L_{10h} > 1000 hours (see diagrams on pages 33 ... 35)
The total dynamic efficiency (η) of UBA Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

$$\eta = \eta_1 \times \eta_2 \times \eta_3$$

where:
η_1 = 0.95 – timing belt transmission efficiency
η_2 = 0.9 – ball screw - nut efficiency
η_3 = 0.9 – bearings and sealing elements “efficiency”

[2] value related to the ball screw lifetime L_{10h} = 1000 h, with constant load, without load vibrations nor shocks; for different lifetime refer to diagrams on pages 33 ... 35

[3] limit value of linear actuator dynamic load capacity (see page 128)

Linear actuators UBA Series

BALL SCREW LINEAR ACTUATORS UBA Series with DC MOTOR
PERFORMANCE with: Duty Cycle F_i = 100 % at ambient temperature 25 °C

LINEAR SPEED [mm/s]	DYNAMIC LOAD [N]	RATIO	MOTOR: POWER [kW] — N° of POLES SPEED [rpm]	SELF-LOCKING COEFFICIENT
UBA 1 with DC motor 24 V 3000 rpm 150 W 8.4 A				
375	300 [1]	RV2	9	0.72
230	500 [1]	RN2	9	0.72
165	700 [1]	RL2	9	0.72
115	1000 [1]	RN1	9	0.72
85	1400 [1]	RL1	9	0.72
UBA 2 with DC motor 24 V 3000 rpm 300 W 15.6 A				
360	650 [1]	RV2	16	0.71
235	1000 [1]	RN2	16	0.71
175	1300 [1]	RL2	16	0.71
120	2000 [1]	RN1	16	0.71
90	2600 [2]	RL1	16	0.71
UBA 3 with DC motor 24 V 3000 rpm 500 W 25 A				
480	800 [1]	RV2	26	0.70
240	1600 [1]	RV1	26	0.70
170	2250 [1]	RL2	26	0.70
125	2700 [2]	RN1	22	0.70
85	3050 [2]	RL1	17.5 (*)	0.70
* - performances with DC motor 24 V 3000 rpm 300 W				
UBA 4 with DC motor 90 V 3000 rpm 750 W 10.6 A				
470	1250 [1]	RV2	11	0.70
260	2250 [1]	RN2	11	0.70
155	3750 [1]	RN1	11	0.70
100	4400 [2]	RL1	8.5	0.70

[1] value limited by electric motor power; ball screw lifetime L_{10h} > 1000 hours (see diagrams on pages 33 ... 35)
The total dynamic efficiency (η) of UBA Series actuators, used to determine the DYNAMIC LOAD is calculated as follows:

$$\eta = \eta_1 \times \eta_2 \times \eta_3$$

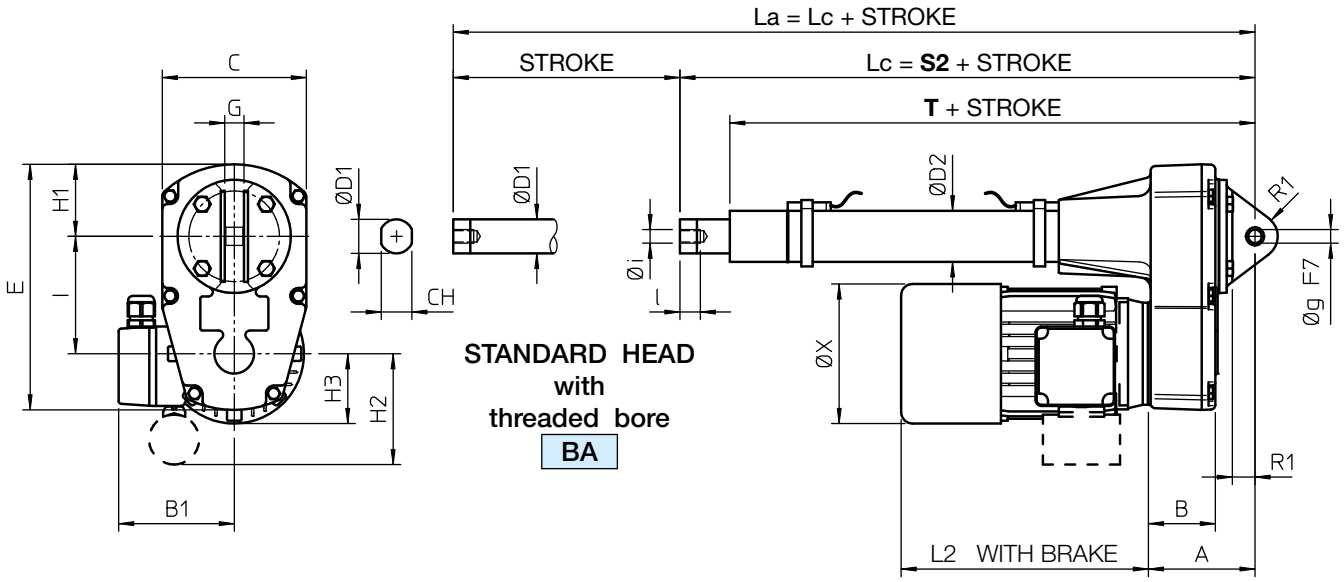
where:
η_1 = 0.95 – timing belt transmission efficiency
η_2 = 0.9 – ball screw - nut efficiency
η_3 = 0.9 – bearings and sealing elements “efficiency”

[2] value related to the ball screw lifetime L_{10h} = 1000 h, with constant load, without load vibrations nor shocks; for different lifetime refer to diagrams on pages 33 ... 35

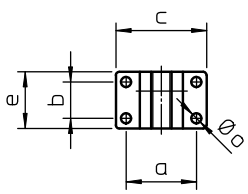
[3] limit value of linear actuator dynamic load capacity (see page 128)

Linear actuators UBA Series

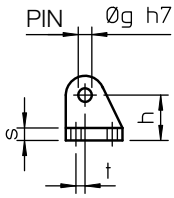
BALL SCREW LINEAR ACTUATORS UBA Series, size 1 — 2 — 3 — 4
AC 3-phase or 1-phase MOTOR — with Magnetic Stroke Limit Switches FCM



STANDARD HEAD with threaded bore **BA**



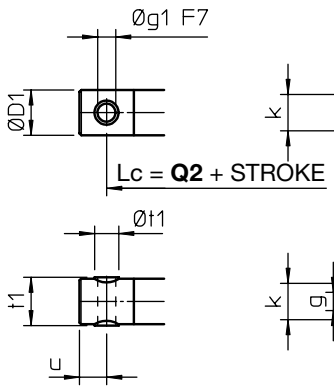
REAR BRACKET **SP**



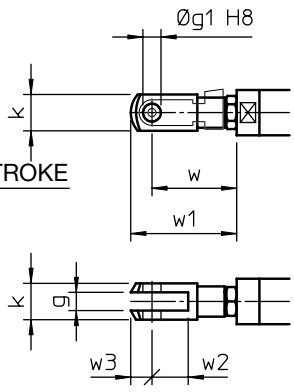
Lc - RETRACTED ACTUATOR length
La - EXTENDED ACTUATOR length

FRONT ATTACHMENTS

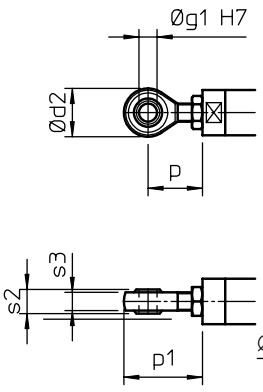
ROD END **ROE**



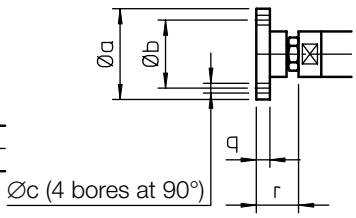
CLEVIS END **FO**



BALL JOINT **TS**

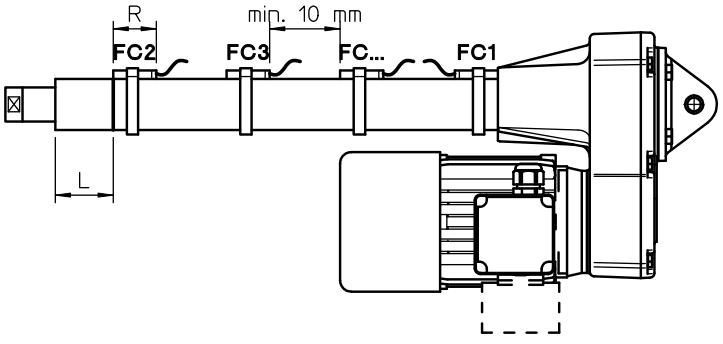


FLANGE END **FL**



MAGNETIC STROKE LIMIT SWITCHES FCM Dimensions

	L	
	REED CONTACT	
	NC or (NC+NO)	NO
UBA 1	42	47
UBA 2	51	56
UBA 3	59	64
UBA 4	69	74



BALL SCREW LINEAR ACTUATORS UBA Series, size 1 — 2 — 3 — 4
AC 3-phase or 1-phase MOTOR — with Magnetic Stroke Limit Switches FCM
STANDARD STROKE LENGTHS

		STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800	S2	T	Q2
UBA 1	R_1	STROKE [mm]	100	200	300	400	500	600	700	800	287	250	287
	R_2										303	266	303
UBA 2	R_1										307	263	310
	R_2										330	286	333
UBA 3	R_1										342	296	348
	R_2										367	321	373
UBA 4	R_1										406	352	418
	R_2										419	365	431

NOTE: Different stroke lengths available on request. La = Lc + STROKE
For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S2**, **T** and **Q2** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.
For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	B1	C	CH	∅ D1	∅ D2	E	G	H1	H2	H3	l	L2
UBA 1	85	52	110	114	22	25	36	189	15	58	75	55	90	193
UBA 2	94	60	115	127	27	30	45	217	17	64	90	62	104	229
UBA 3	106	71	124	135	30	35	55	247	20	68	90	75	121	304
UBA 4	120	77	141	161	36	40	60	293	24	81	95	90	138	340

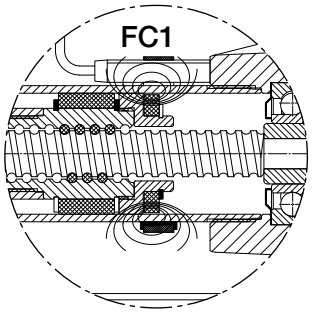
	R1	∅ X	a	b	c	e	∅ g	h	∅ i	*l*	∅ o	r1	s	t
UBA 1	17	110	54	28	73	46	10	36	M10×1.5	17	9	18	10	4
UBA 2	20	123	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
UBA 3	20	150	72	38	90	58	14	45	M14×2	24	9	22	12	8
UBA 4	22	170	85	55	110	81	20	58	M20×1.5	27	11	29	15	15

FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	g	∅ g1	k	p	p1
UBA 1	55	40	5.5	25	28	10	10	20	31	45
UBA 2	60	45	6.5	30	32	12	12	24	36	52
UBA 3	65	50	6.5	35	36	14	14	27	36	54
UBA 4	80	60	8.5	40	50	20	20	40	53	78

	q	r	s2	s3	t1	∅ t1	u	w	w1	w2	w3
UBA 1	8	27	14	11	26	14	15	49	61	20	12
UBA 2	9	28	16	12	32	16	18	56	70	24	14
UBA 3	9	32	19	14	36	18	21	65	81	28	16
UBA 4	10	42	25	18	42	25	27	90	115	40	25

MAGNETIC STROKE LIMIT SWITCHES FCM Technical features and dimensions

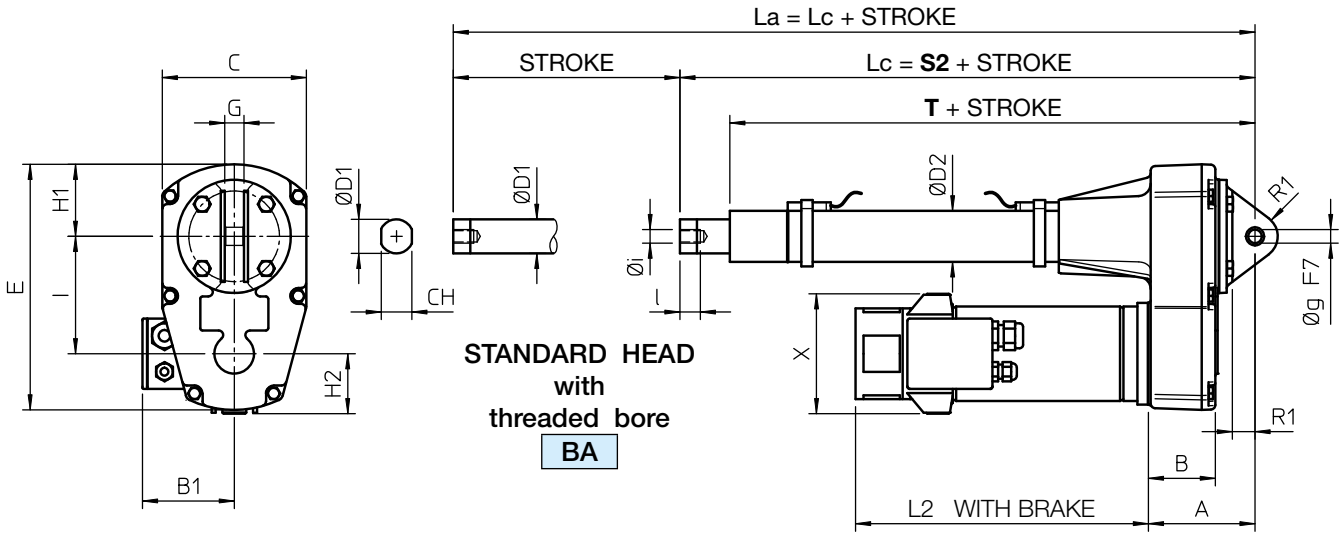


Note: - Additional extra magnetic REED SWITCHES are available for intermediate positions.
- The minimum distance between the REED SWITCHES must be of at least 10 mm.

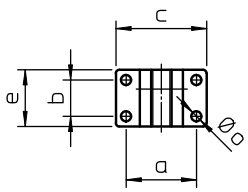
-	REED SWITCH	Normally Closed	(NC) R = 39 mm
-	REED SWITCH	Change-over	(NC+NO) R = 39 mm
-	REED SWITCH	Normally Open	(NO) R = 29 mm

Linear actuators UBA Series

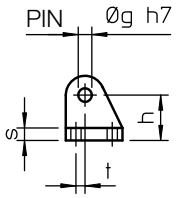
BALL SCREW LINEAR ACTUATORS UBA Series, size 1 — 2 — 3 — 4
DC MOTOR — with Magnetic Stroke Limit Switches FCM



STANDARD HEAD
with
threaded bore
BA



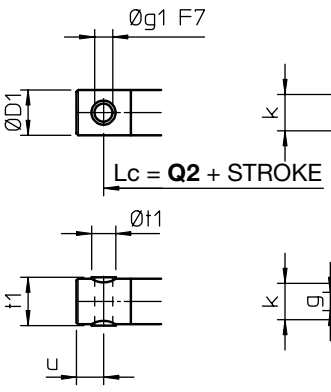
REAR
BRACKET
SP



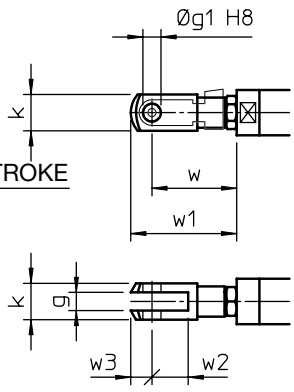
Lc - RETRACTED ACTUATOR length
La - EXTENDED ACTUATOR length

FRONT ATTACHMENTS

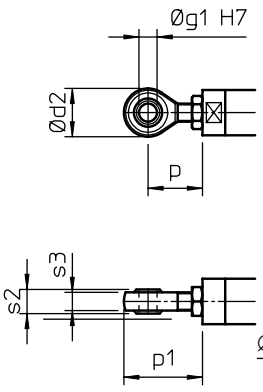
ROD END
ROE



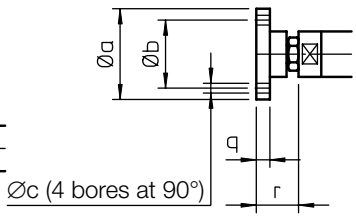
CLEVIS END
FO



BALL JOINT
TS

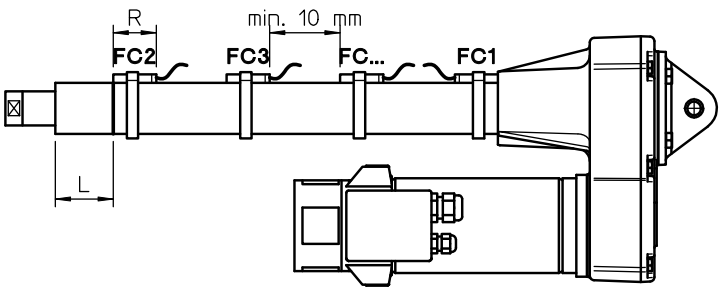


FLANGE END
FL



MAGNETIC STROKE LIMIT SWITCHES FCM Dimensions

	L	
	REED CONTACT	
	NC or (NC+NO)	NO
UBA 1	42	47
UBA 2	51	56
UBA 3	59	64
UBA 4	69	74



BALL SCREW LINEAR ACTUATORS UBA Series, size 1 — 2 — 3 — 4
DC MOTOR — with Magnetic Stroke Limit Switches FCM
STANDARD STROKE LENGTHS

		STROKE CODE	C100	C200	C300	C400	C500	C600	C700	C800	S2	T	Q2
UBA 1	R_1	STROKE [mm]	100	200	300	400	500	600	700	800	287	250	287
	R_2										303	266	303
UBA 2	R_1										307	263	310
	R_2										330	286	333
UBA 3	R_1										342	296	348
	R_2										367	321	373
UBA 4	R_1										406	352	418
	R_2										419	365	431

NOTE: Different stroke lengths available on request. La = Lc + STROKE
For stroke lengths longer than 800 mm it is necessary to increase the guided length between push rod and outer tube to avoid axial backlash. Dimensions **S2**, **T** and **Q2** shall be considered increased by 200 mm for stroke lengths up to 1500 mm.
For stroke lengths longer than 1500 mm, please, contact SERVOMECH.

	A	B	B1	C	CH	∅ D1	∅ D2	E	G	H1	H2	H3	l	L2
UBA 1	85	52	80	114	22	25	36	189	15	58	75	55	90	193
UBA 2	94	60	80	127	27	30	45	217	17	64	90	62	104	229
UBA 3	106	71	80	135	30	35	55	247	20	68	90	75	121	304
UBA 4	120	77	118	161	36	40	60	293	24	81	95	90	138	340

	R1	X	a	b	c	e	∅ g	h	∅ i	*l*	∅ o	r1	s	t
UBA 1	17	107	54	28	73	46	10	36	M10×1.5	17	9	18	10	4
UBA 2	20	107	62	32	80	50	12	40	M12×1.75	18	9	20	11	8
UBA 3	20	107	72	38	90	58	14	45	M14×2	24	9	22	12	8
UBA 4	22	138	85	55	110	81	20	58	M20×1.5	27	11	29	15	15

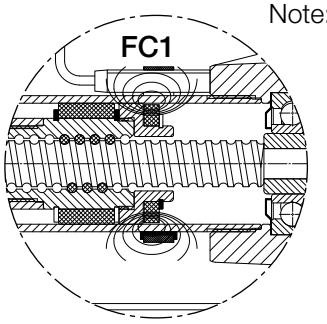
4

FRONT ATTACHMENT Dimensions

	∅ a	∅ b	∅ c	∅ D1	∅ d2	g	∅ g1	k	p	p1
UBA 1	55	40	5.5	25	28	10	10	20	31	45
UBA 2	60	45	6.5	30	32	12	12	24	36	52
UBA 3	65	50	6.5	35	36	14	14	27	36	54
UBA 4	80	60	8.5	40	50	20	20	40	53	78

	q	r	s2	s3	t1	∅ t1	u	w	w1	w2	w3
UBA 1	8	27	14	11	26	14	15	49	61	20	12
UBA 2	9	28	16	12	32	16	18	56	70	24	14
UBA 3	9	32	19	14	36	18	21	65	81	28	16
UBA 4	10	42	25	18	42	25	27	90	115	40	25

MAGNETIC STROKE LIMIT SWITCHES FCM Technical features and dimensions



Note: - Additional extra magnetic REED SWITCHES are available for intermediate positions.
- The minimum distance between the REED SWITCHES must be of at least 10 mm.
- REED SWITCH Normally Closed (NC) R = 39 mm
- REED SWITCH Change-over (NC+NO) R = 39 mm
- REED SWITCH Normally Open (NO) R = 29 mm