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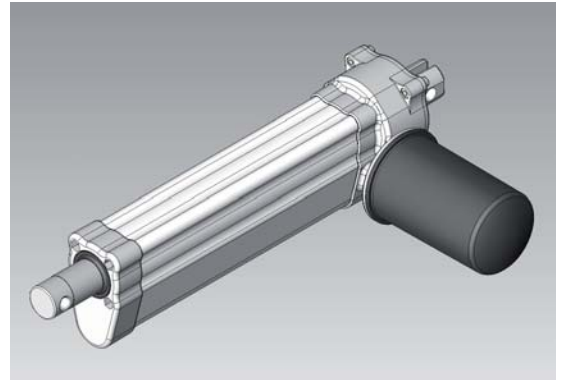
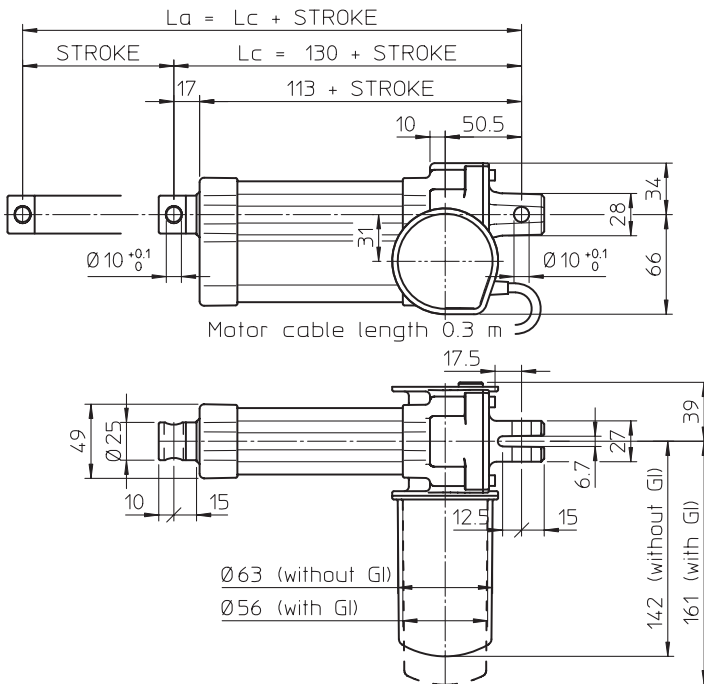
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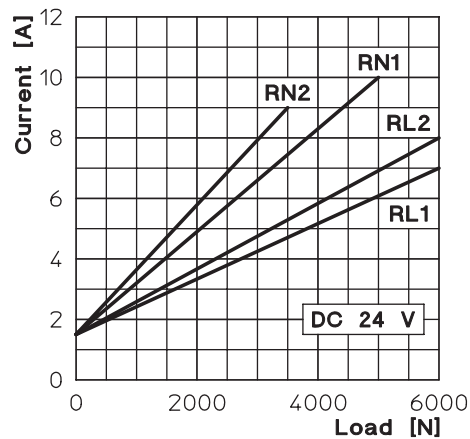
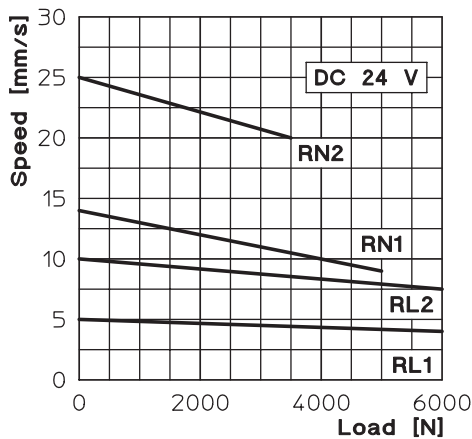
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OVERALL DIMENSIONS



STROKE CODE	LENGTH		WEIGHT [kg]
	Lc [mm]	La [mm]	
C100	230	330	2.6
C150	280	430	2.9
C200	330	530	3.2
C250	380	630	3.5
C300	430	730	3.8

PERFORMANCES with 24 V DC motor



Performances with 12 V DC motor: same load - speed 10 % less, current 2 times

PERFORMANCES AND FEATURES

- Push and pull load up to 6 000 N
- Linear speed up to 25 mm/s
- Standard strokes: 100, 150, 200, 250, 300 mm
- Housing and rear attachment in aluminium
- Push rod in chrome-plated steel
- Front attachment in stainless steel AISI 303
- 12, 24 or 36 V DC motor with electromagnetic noise suppressor, standard protection IP 65
- Maximum duty cycle: 15% over 10 min at (- 10 ... + 40)°C
- Standard motor mounting position as on the sketch (right-hand, code RH)
- Long life lubrication, maintenance free

OPTIONS

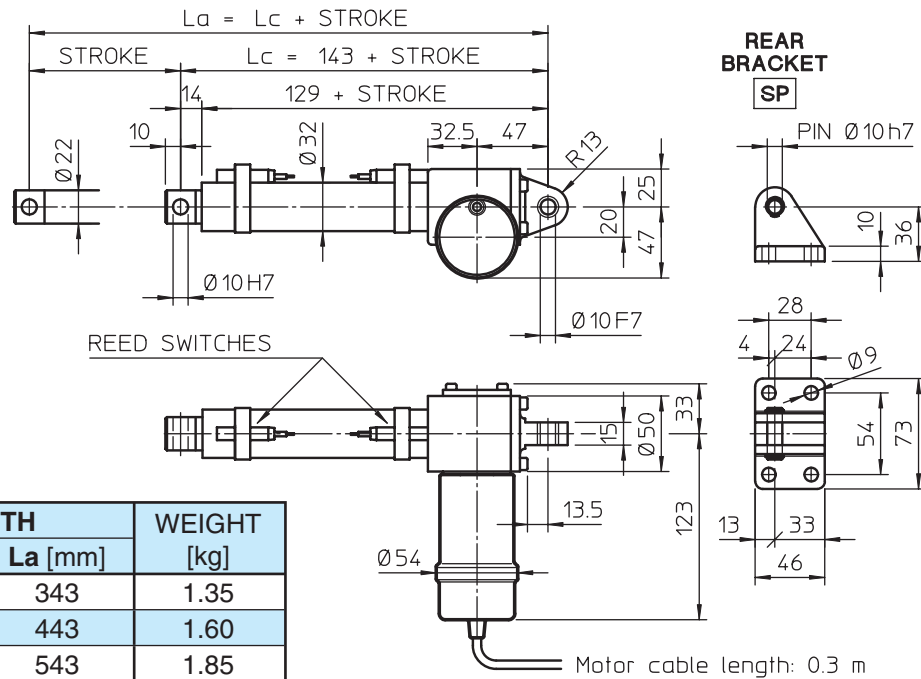
- Fixing end holes turned through 90° (code RPT 90)
- Anti-turn device (code AR)
- Motor mounted on opposite side (left-hand, code LH)
- Two adjustable built-in switches (code FC2)
- Two adjustable built-in switches, switching off the motor (code FC2X)
- One or more microswitches for intermediate position
- Encoder 1 ppr (code GI 21) or 4 ppr (code GI 24) on motor shaft

Number of pulses per 100 mm of travel	Ratio			
	RN2	RN1	RL2	RL1
GI 21	325	650	862	1 725
GI 24	1 300	2 600	3 450	6 900

ORDERING EXAMPLE

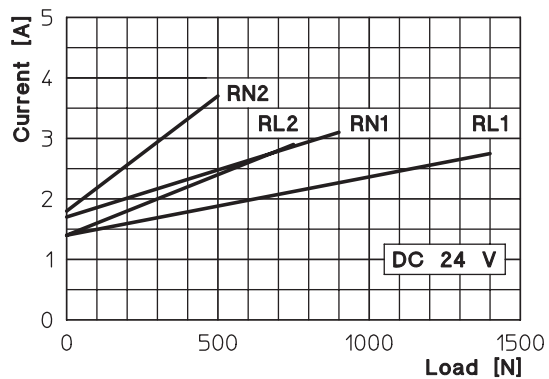
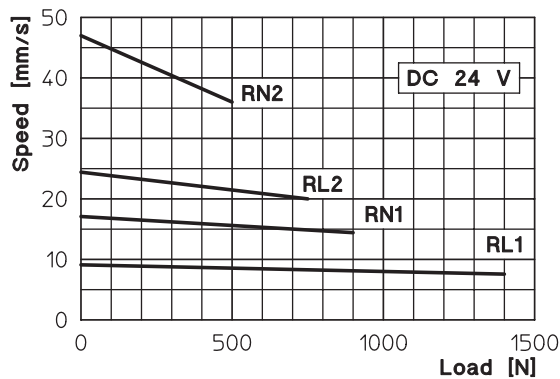
LMR 03	RN1	C300	FC2	DC 24 V	RH	RPT 90	AR	GI 21
Series and size	Ratio	Stroke	Stroke end switches	Motor	Motor mounting	Fixing ends turned 90°	Anti-turn device	Encoder

OVERALL DIMENSIONS



STROKE CODE	LENGTH		WEIGHT [kg]
	Lc [mm]	La [mm]	
C100	243	343	1.35
C150	293	443	1.60
C200	343	543	1.85
C300	443	743	2.10

PERFORMANCES with 24 V DC motor



Performances with 12 V DC motor: same load - speed 10 % less, current 2 times

PERFORMANCES AND FEATURES

- Push and pull load up to 1 400 N
- Linear speed up to 47 mm/s
- Standard strokes: 100, 150, 200, 300 mm
- Housing and rear attachment in aluminium alloy
- External tube in anodized aluminium
- Push rod in anodized aluminium
- Front attachment in stainless steel AISI 303
- 12, 24 or 36 V DC motor with electromagnetic noise suppressor, standard protection IP 65
- Maxi. duty cycle: 15 % over 10 min at (- 10 ... + 40)°C
- Standard motor mounting position as on the sketch (right-hand, code RH)
- Long life lubrication, maintenance free

OPTIONS

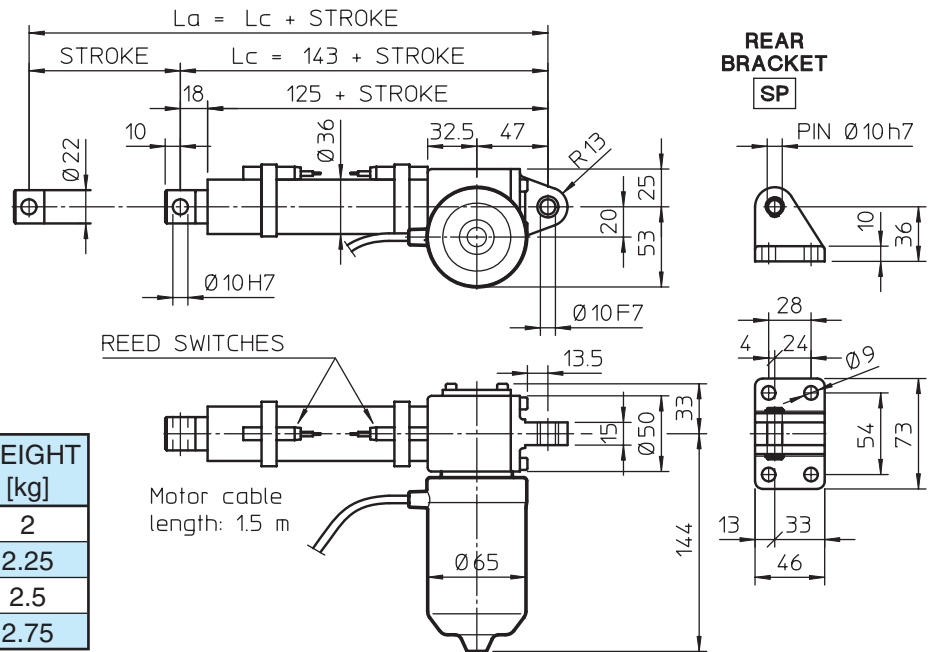
- Fixing ends rotated through 90° (code RPT 90)
- Rear bracket (code SP)
- Motor mounted on opposite side (left-hand, code LH)
- Two adjustable magnetic switches (code FCM)
- One or more magnetic switches for intermediate position

ORDERING EXAMPLE

ATL 02	RL1	C200	FCM	DC 24 V	RH	RPT 90	SP
Series and size	Ratio	Stroke	Stroke end switches	Motor	Motor mounting	Fixing ends turned 90°	Rear bracket

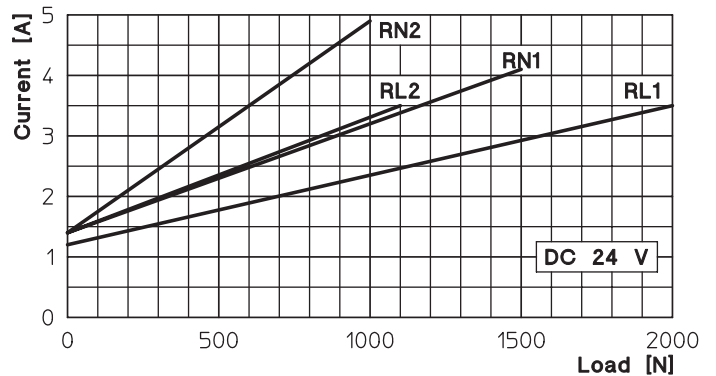
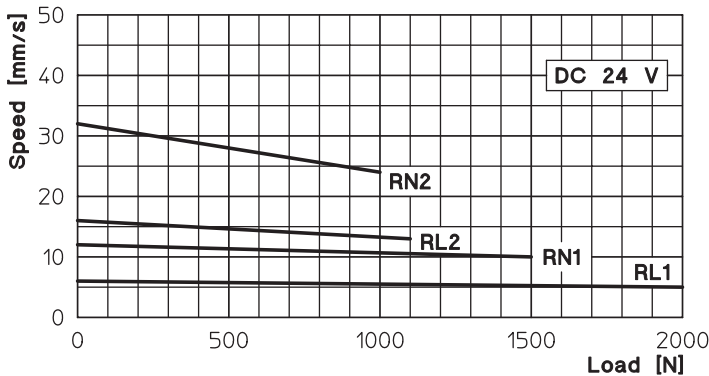
OVERALL DIMENSIONS

ATL 05



STROKE CODE	LENGTH		WEIGHT [kg]
	Lc [mm]	La [mm]	
C100	243	343	2
C150	293	443	2.25
C200	343	543	2.5
C300	443	743	2.75

ATL 05 - PERFORMANCES with 24 V DC motor



Performances with 12 V DC motor: same load - speed 10 % less, current 2 times

PERFORMANCES AND FEATURES

- Push and pull load up to 2 000 N (ATL 05) - 4 000 N (ATL 08)
- Linear speed up to 32 mm/s (ATL 05) - 64 mm/s (ATL 08)
- Standard strokes: 100, 150, 200, 300 mm (ATL 05)
100, 200, 300, 400, 500 mm (ATL 08)
- Housing and rear attachment in aluminium alloy
- External tube in anodized aluminium
- Push rod in anodized aluminium (ATL 05)
chrome-plated steel (ATL 08)
- Front attachment in stainless steel AISI 303
- 12, 24 or 36 V DC motor with electromagnetic noise suppressor, standard protection IP 65
- Max. duty cycle: 15 % over 10 min at (- 10 ... + 40)°C
- Standard motor mounting position as on the sketch (right-hand, code RH)
- Long life lubrication, maintenance free

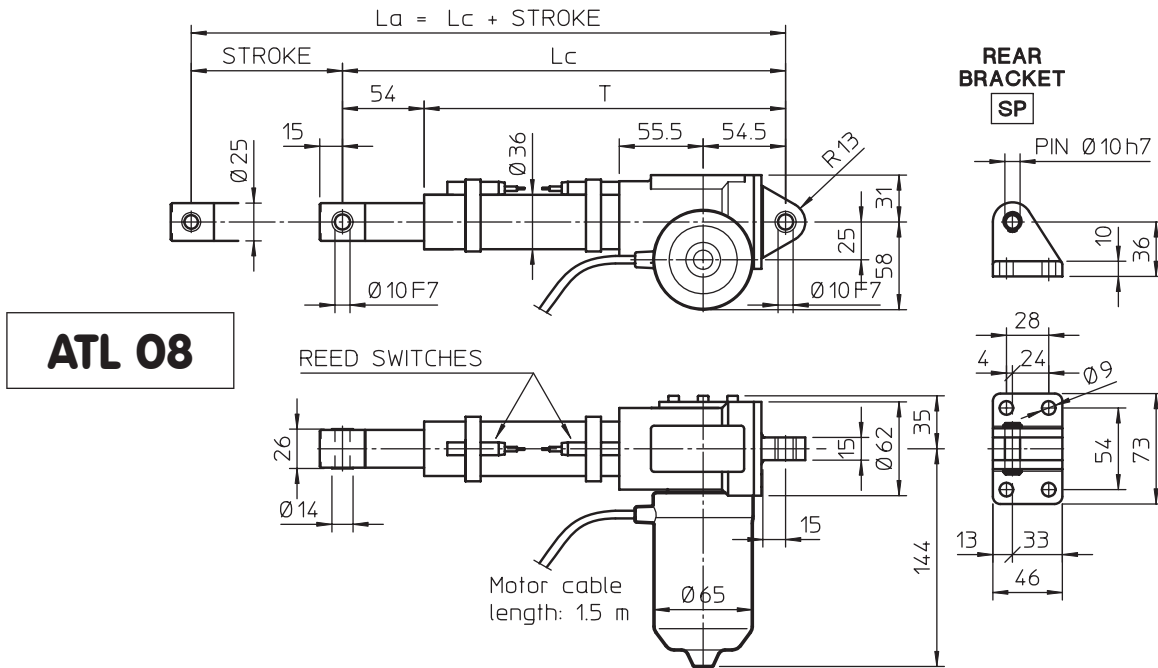
OPTIONS

- Fixing ends rotated through 90° (code RPT 90)
- Rear bracket (code SP)
- Mechanical overload protection: safety clutch (code FS) available on ATL 08
- Motor mounted on opposite side (left-hand, code LH)
- Two adjustable magnetic switches (code FCM)
- One or more magnetic switches for intermediate position
- Pulse generator on motor shaft (motor protection IP 42) 1 ppr (code GI 11) or 3 ppr (code GI 13), available on request (min. order quantity: 50)

ORDERING EXAMPLE

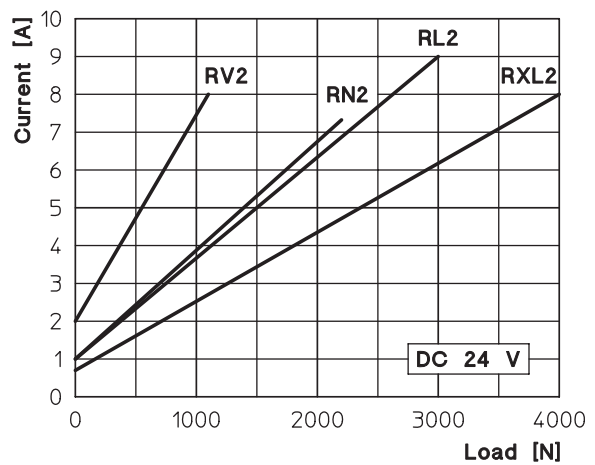
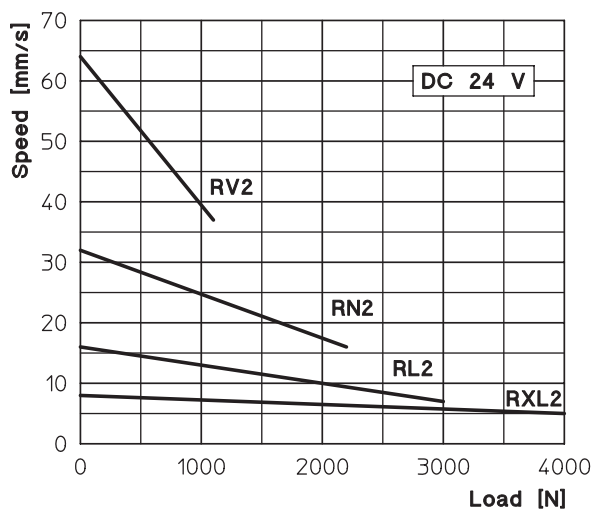
ATL 05	RL2	C200	FCM	DC 24 V	RH	RPT 90	SP
Series and size	Ratio	Stroke	Stroke end switches	Motor	Motor mounting	Fixing ends turned 90°	Rear bracket

OVERALL DIMENSIONS



STROKE CODE	Actuator without FCM		Actuator with FCM			T [mm]	WEIGHT [kg]	
	STROKE [mm]	LENGTH	STROKE [mm]	LENGTH				
		Lc [mm]	La [mm]	STROKE [mm]	Lc [mm]	La [mm]		
C100	100	266	366	73	293	366	239	3.5
C200	200	366	566	173	393	566	339	3.8
C300	300	466	766	273	493	766	439	4.1
C400	400	566	966	373	593	966	539	4.4
C500	500	666	1166	473	693	1166	639	4.7

ATL 08 - PERFORMANCES with 24 V DC motor

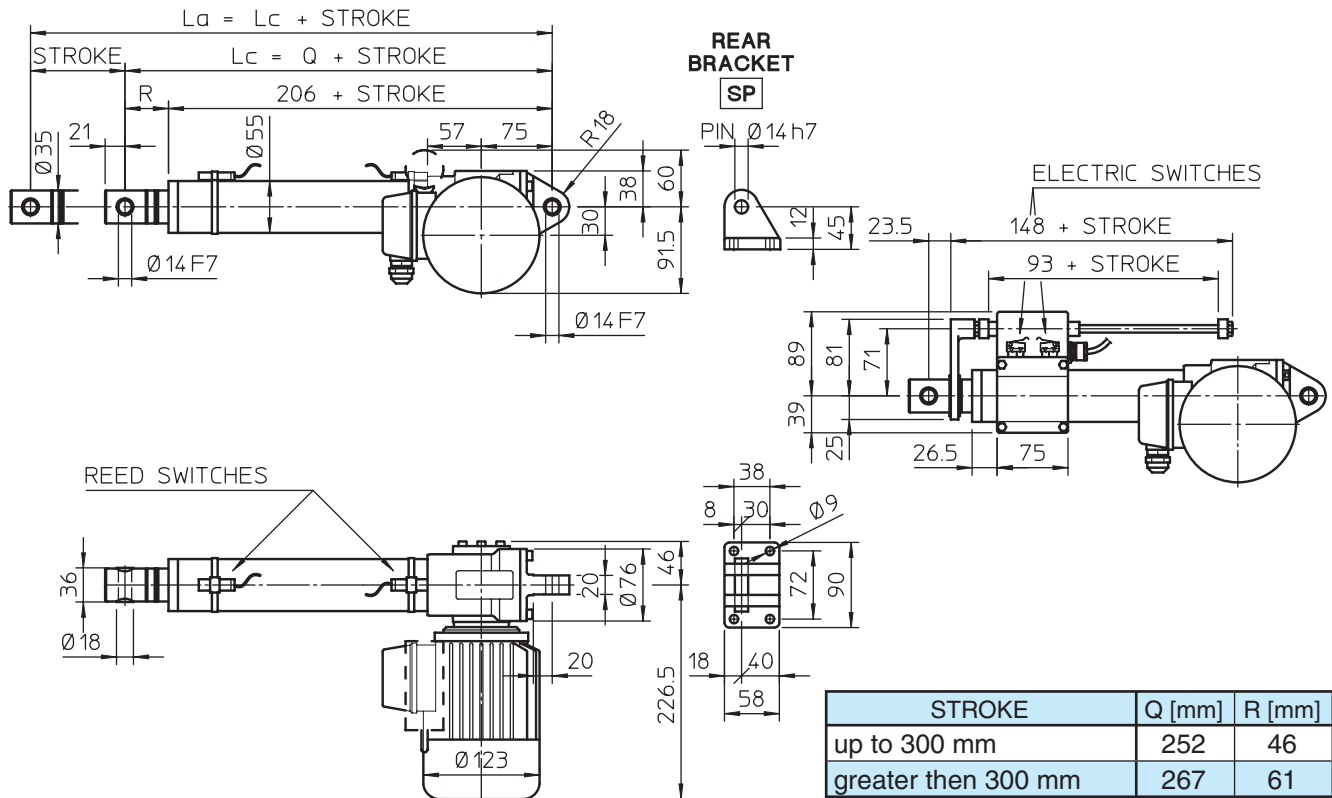


Performances with 12 V DC motor: same load - speed 10 % less, current 2 times

ORDERING EXAMPLE

ATL 08	RL2	C400	FCM	DC 24 V	RH	RPT 90	SP
Series and size	Ratio	Stroke	Stroke end switches	Motor	Motor mounting	Fixing ends turned 90°	Rear bracket

OVERALL DIMENSIONS



PERFORMANCES with AC motor		
3-phase 0.25 kW 2-pole 230/400 V 50 Hz		
1-phase 0.25 kW 2-pole 230 V 50 Hz		
SPEED [mm/s]	MAX. LOAD [N]	RATIO
23	4 800	RN2
11	10 000	RL2
5.5	11 000	RL1

PERFORMANCES AND FEATURES

- Push and pull load up to 11 000 N
- Linear speed up to 23 mm/s
- Standard strokes: 100, 200, 300, 400, 500 mm
- Housing and rear attachment in aluminium alloy
- External tube in anodized aluminium
- Push rod in chrome-plated steel
- Front attachment in stainless steel AISI 303
- 3-phase 230/400 V 50 Hz or 1-phase 230 V 50 Hz motor standard protection IP 55
- Maxi. duty cycle: 30 % over 10 min at (- 10 ... + 40)°C
- Standard motor mounting position as on the sketch (right-hand, code RH)
- Long life lubrication, maintenance free

OPTIONS

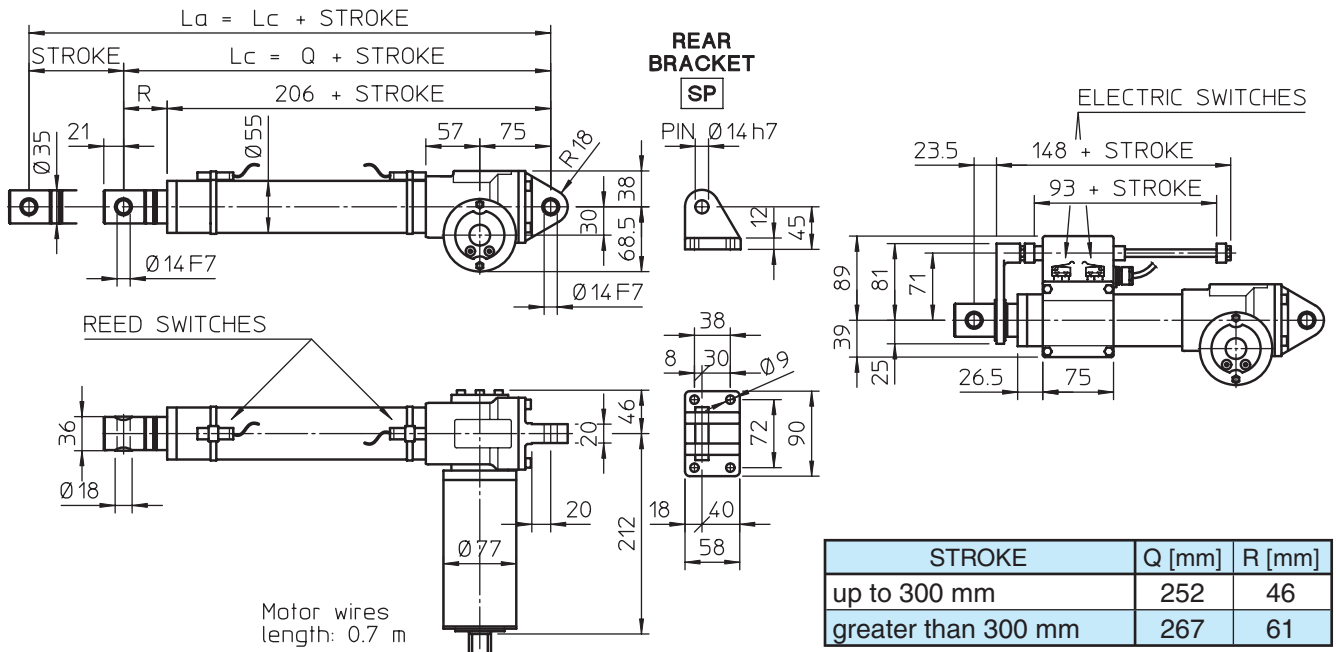
- Fixing ends rotated through 90° (code RPT 90)
- Rear bracket (code SP)
- Mechanical overload protection: safety clutch (code FS)
- Motor mounted on opposite side (left-hand, code LH)
- Adjustable electric stroke end switches (code FCE)
- Two adjustable magnetic switches (code FCM)
- One or more magnetic switches for intermediate position

Execution with ball screw dia. 20 × lead 5 (code BSA 12) available on request. Ask for dimensions and performances.

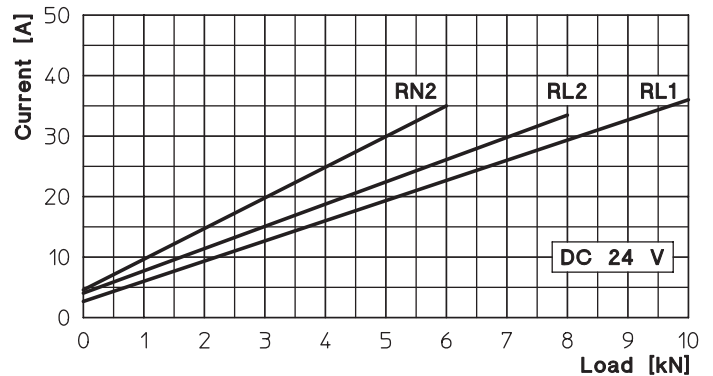
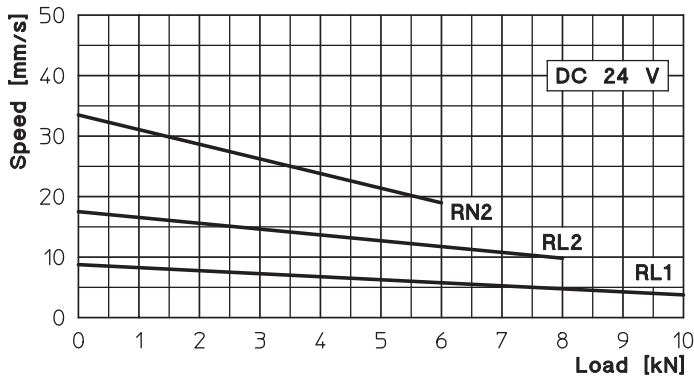
ORDERING EXAMPLE

ATL 12	RL2	C400	FCM	230 V 50 Hz	RH	RPT 90	SP
Series and size	Ratio	Stroke	Stroke end switches	Motor	Motor mounting	Fixing ends rotated	Rear bracket

OVERALL DIMENSIONS



PERFORMANCES with 24 V DC motor



PERFORMANCES AND FEATURES

- Push and pull load up to 10 000 N
- Linear speed up to 33 mm/s
- Standard strokes: 100, 200, 300, 400, 500 mm
- Housing and rear attachment in aluminium alloy
- External tube in anodized aluminium
- Push rod in chrome-plated steel
- Front attachment in stainless steel AISI 303
- 24 V or 36 V DC motor with electromagnetic noise suppressor, standard protection IP 20
- Max. duty cycle: 15 % over 10 min at (- 10 ... + 40)°C
- Standard motor mounting position as on the sketch (right-hand, code RH)
- Long life lubrication, maintenance free

OPTIONS

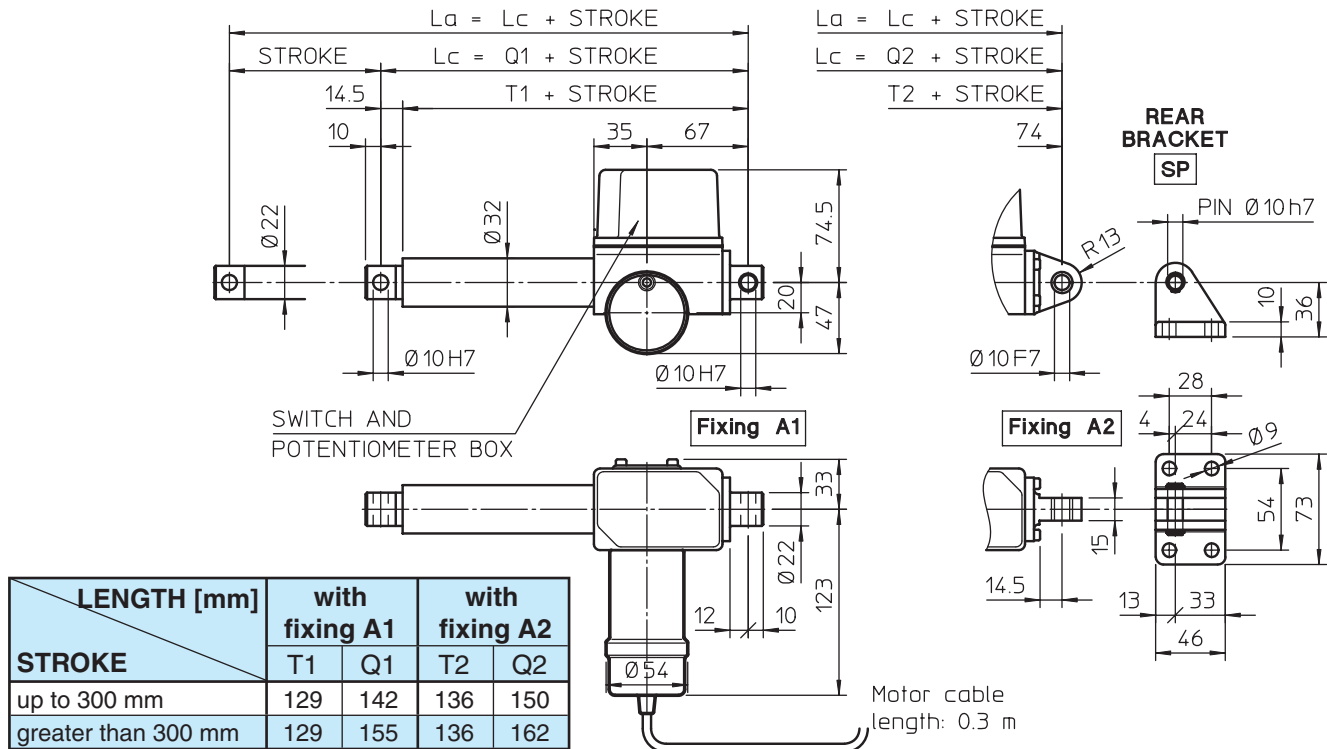
- Fixing ends rotated through 90° (code RPT 90)
- Rear bracket (code SP)
- Mechanical overload protection: safety clutch (code FS)
- Motor mounted on opposite side (left-hand, code LH)
- Adjustable electric stroke end switches (code FCE)
- Two adjustable magnetic switches (code FCM)
- One or more magnetic switches for intermediate position
- Encoder on motor shaft
1 ppr (code GI 21) or 3 ppr (code GI 23), available on request (min. order quantity: 50)

Execution with ball screw dia. 20 × lead 5 (code BSA 12) available on request. Ask for dimensions and performances.

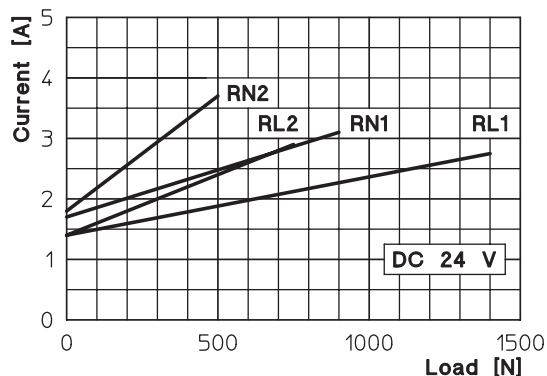
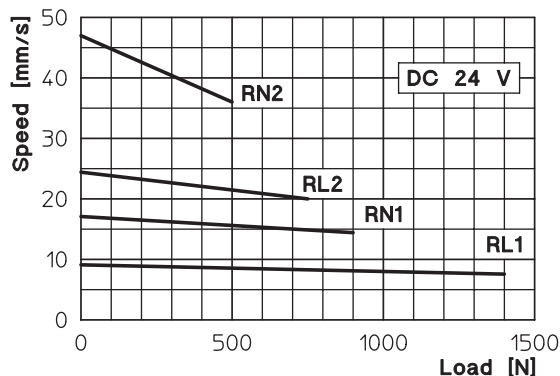
ORDERING EXAMPLE

ATL 12	RL2	C400	FCE	DC 24 V	RH	RPT 90	SP
Series and size	Ratio	Stroke	Stroke end switches	Motor	Motor mounting	Fixing ends rotated 90°	Rear bracket

OVERALL DIMENSIONS



PERFORMANCES with 24 V DC motor



Performances with 12 V DC motor: same load - speed 10 % less, current 2 times

PERFORMANCES AND FEATURES

- Push and pull load up to 1 400 N
- Linear speed up to 47 mm/s
- Standard strokes: 100, 200, 300, 400 mm
- Housing in aluminium alloy
- Rear attachment A1 in zinc-plated steel rear attachment A2 in aluminium alloy
- External tube in anodized aluminium
- Push rod in anodized aluminium
- Front attachment in stainless steel AISI 303
- 12, 24 or 36 V DC motor with electromagnetic noise suppressor, standard protection IP 65
- Max. duty cycle: 15 % over 10 min at (- 10 ... + 40)°C
- Standard motor mounting position as on the sketch (right-hand, code RH)
- Long life lubrication, maintenance free

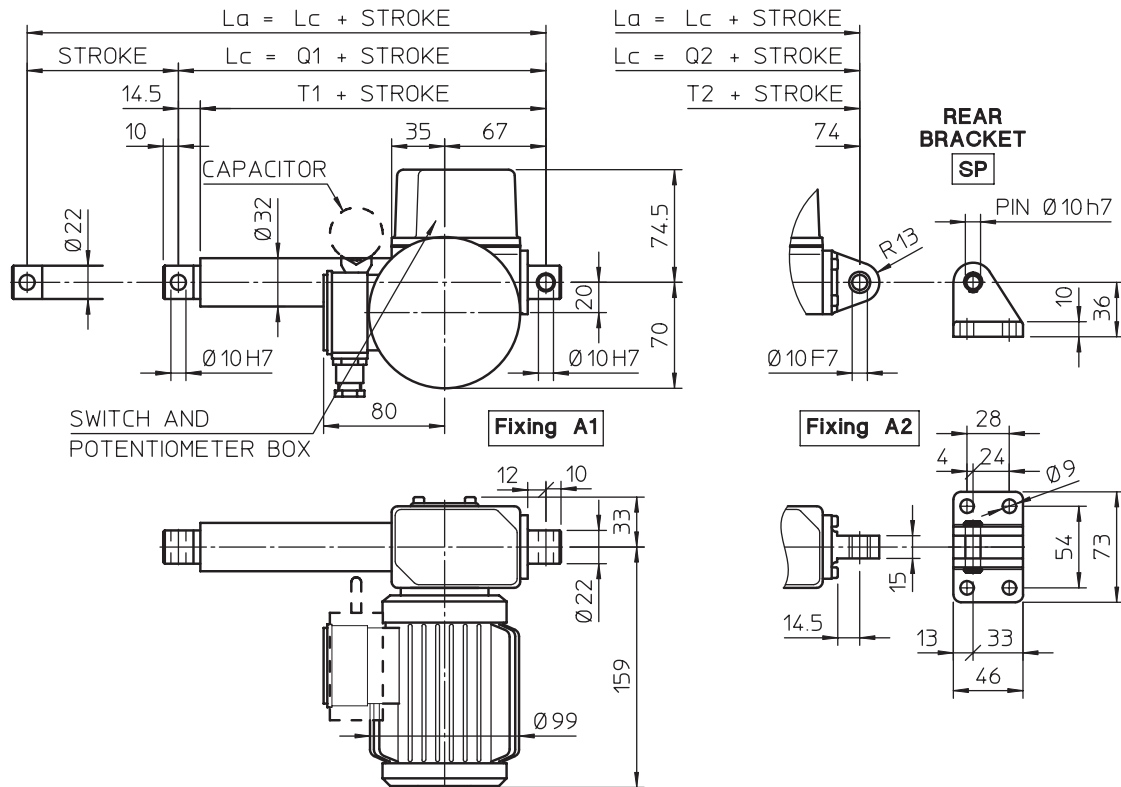
OPTIONS

- Fixing ends rotated through 90° (code RPT 90)
- Rear bracket (code SP) with rear attachment A2
- Motor mounted on opposite side (left-hand, code LH)
- Two adjustable cam-operated electric switches (code FC2)
- Two adjustable cam-operated electric switches, switching off the motor (code FC2X)
- Third microswitch for intermediate position (code ... + FC)
- Positioning control with rotative potentiometer 5 kΩ (code POR 5k)

Execution with ball screw dia. 14 x lead 5 (code CLB 20) available on request. Ask for dimensions and performances.

ORDERING EXAMPLE

CLA 20	RL1	C200	FC2X	POR 5k	A2	DC 24 V	RH	RPT 90	SP
Series and size	Ratio	Stroke	Stroke end switches	Rotative potentiometer	Rear attachment	Motor	Motor mounting	Fixing ends rotated 90°	Rear bracket

OVERALL DIMENSIONS


PERFORMANCES with AC motor without fan		
1-phase 230 V 50 Hz 0.06 kW 2-pole		
3-phase 230/400 V 50 Hz 0.06 kW 2-pole		
SPEED [mm/s]	MAX. LOAD [N]	RATIO
30	1 000	RN2
15	1 100	RL2
11	1 500	RN1
5.5	2 000	RL1

STROKE	LENGTH [mm]			
	with fixing A1		with fixing A2	
	T1	Q1	T2	Q2
up to 300 mm	129	142	136	150
greater than 300 mm	129	155	136	162

PERFORMANCES AND FEATURES

- Push and pull load up to 2 000 N
- Linear speed up to 30 mm/s
- Standard strokes: 100, 200, 300, 400 mm
- Housing in aluminium alloy
- Rear attachment A1 in zinc-plated steel rear attachment A2 in aluminium alloy
- External tube in anodized aluminium
- Push rod in anodized aluminium
- Front attachment in stainless steel AISI 303
- 1-phase 230 V 50 Hz or 3-phase 230/400 V 50 Hz motor, standard protection IP 55
- Max. duty cycle: 30 % over 10 min at (- 10 ... + 40)°C
- Standard motor mounting position as on the sketch (right-hand, code RH)
- Long life lubrication, maintenance free

OPTIONS

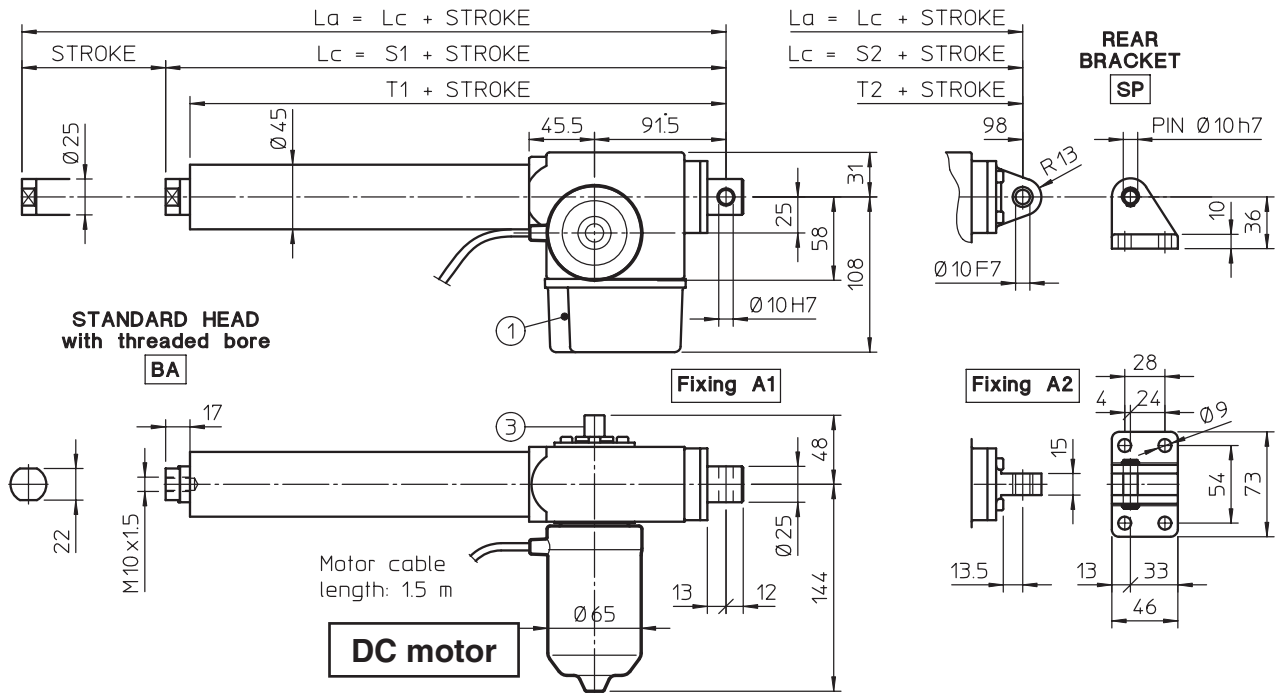
- Fixing ends rotated through 90° (code RPT 90)
- Rear bracket (code SP) with rear attachment A2 only
- Motor mounted on opposite side (left-hand, code LH)
- Two adjustable cam-operated electric switches (code FC2)
- Two adjustable cam-operated electric switches, switching off the motor (code FC2X)
- Third microswitch for intermediate position (code ... + FC)
- Positioning control with rotative potentiometer 5 k Ω (code POR 5k)

Execution with ball screw dia. 14 × lead 5 (code CLB 20) available on request. Ask for dimensions and performances.

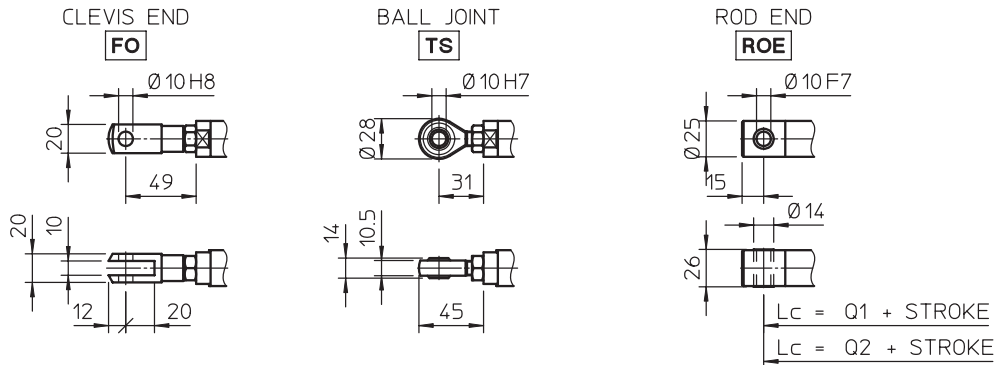
ORDERING EXAMPLE

CLA 20	RL1	C200	FC2	POR 5k	A1	230/400 V 50 Hz	RH	RPT 90
Series and size	Ratio	Stroke	Stroke end switches	Rotative potentiometer	Rear attachment	Motor	Motor mounting	Fixing ends rotated 90°

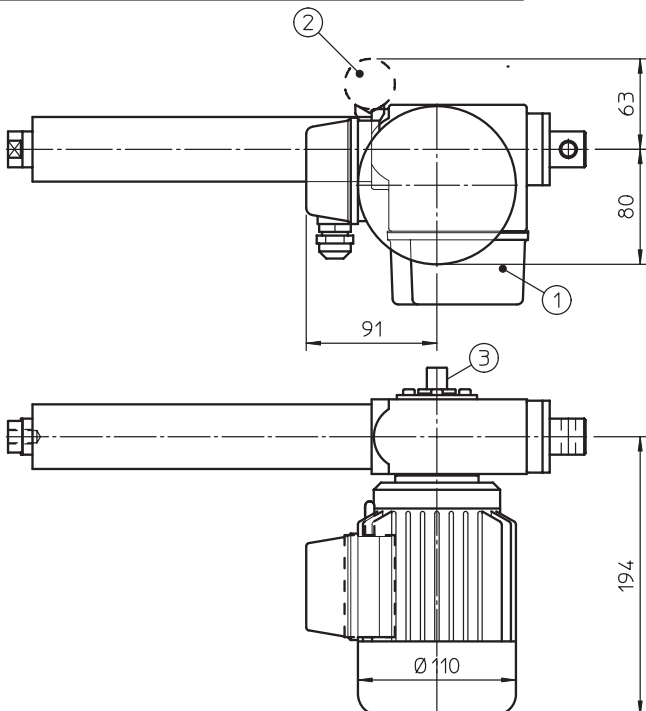
OVERALL DIMENSIONS



FRONT ATTACHMENT



AC motor 3-phase or 1-phase

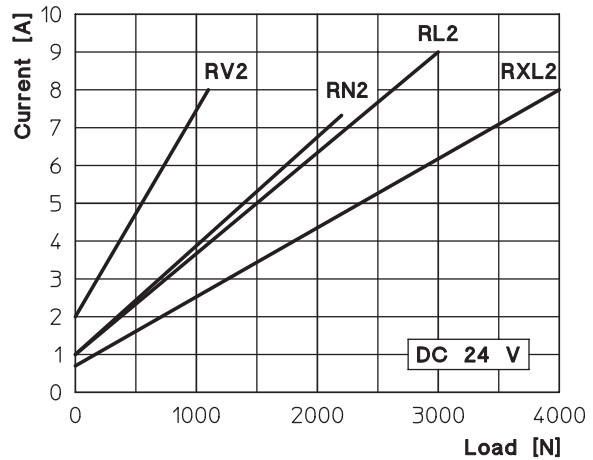
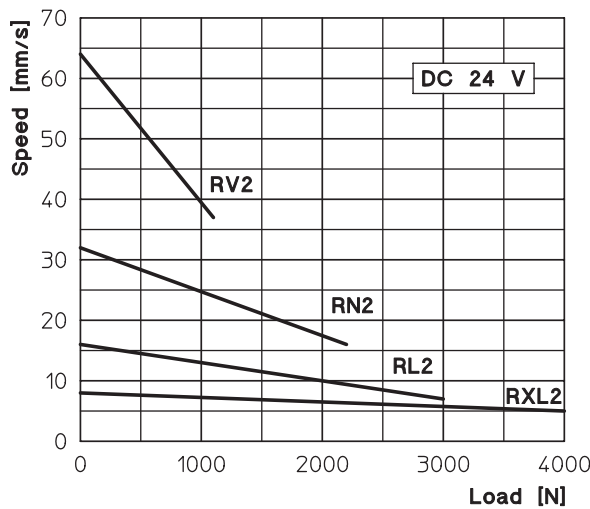


- 1 - SWITCH AND POTENTIOMETER BOX
- 2 - CAPACITOR (1-phase motor)
- 3 - MOTOR SHAFT EXTENSION for:
emergency hand crank
switches and potentiometer manual set-up

LENGTH [mm] with fixing A1			
STROKE	S1	T1	Q1
up to 300 mm	190	173	195
greater than 300 mm	202	173	207

LENGTH [mm] with fixing A2			
STROKE	S2	T2	Q2
up to 300 mm	197	180	202
greater than 300 mm	209	180	214

PERFORMANCES with 24 V DC motor



Performances with 12 V DC motor: same load - speed 10 % less, current 2 times

PERFORMANCES with AC motor 3-phase 230/400 V 50 Hz or 1-phase 230 V 50 Hz					
SPEED [mm/s]	MAX. LOAD [N]	RATIO	MOTOR POWER [kW]	N° OF POLES	SPEED [rpm]
60	1 150	RV2	0.12 kW	2-pole	2 800 rpm
46	1 250	RH1	0.12 kW	2-pole	2 800 rpm
30	2 000	RN2	0.12 kW	2-pole	2 800 rpm
23	1 500	RH1	0.09 kW	4-pole	1 400 rpm
15	3 000	RL2	0.12 kW	2-pole	2 800 rpm
7.5	4 000	RL1	0.12 kW	2-pole	2 800 rpm
3.5	4 000	RL1	0.09 kW	4-pole	1 400 rpm
1.9	4 000	RXL1	0.09 kW	4-pole	1 400 rpm

PERFORMANCES AND FEATURES

- Push and pull load up to 4 000 N
- Linear speed up to 63 mm/s
- Standard strokes: 100, 200, 300, 400 mm
- Housing in aluminium alloy
- Rear attachment A1 in zinc-plated steel
rear attachment A2 in aluminium alloy
- External tube in anodized aluminium
- Push rod in chrome-plated steel
- 12, 24 or 36 V DC motor with electromagnetic noise suppressor, standard protection IP 65
- Max. duty cycle with DC motor:
15 % over 10 minutes at (- 10 ... + 40)°C
- 1-phase 230 V 50 Hz or 3-phase 230/400 V 50 Hz motor, standard protection IP 55
- Max. duty cycle with AC motor:
30 % over 10 minutes at (- 10 ... + 40)°C
- Standard motor mounting position as on the sketch (right-hand, code RH)
- Long life lubrication, maintenance free

OPTIONS

- Fixing ends rotated through 90° (code RPT 90)
- Rear bracket (code SP) with rear attachment A2 only
- Motor mounted on opposite side (left-hand, code LH)
- Mechanical overload protection: safety clutch (code FS)
- Two adjustable cam-operated electric switches (code FC2)
- Two adjustable cam-operated electric switches, switching off the motor (code FC2X) with DC motor or AC 1-phase motor
- Third microswitch for intermediate position (code ... + FC)
- Positioning control with rotative potentiometer 5 kΩ (code POR 5k)
- Anti-turn device (code AR) available on CLA 25 S (ask for dimensions)

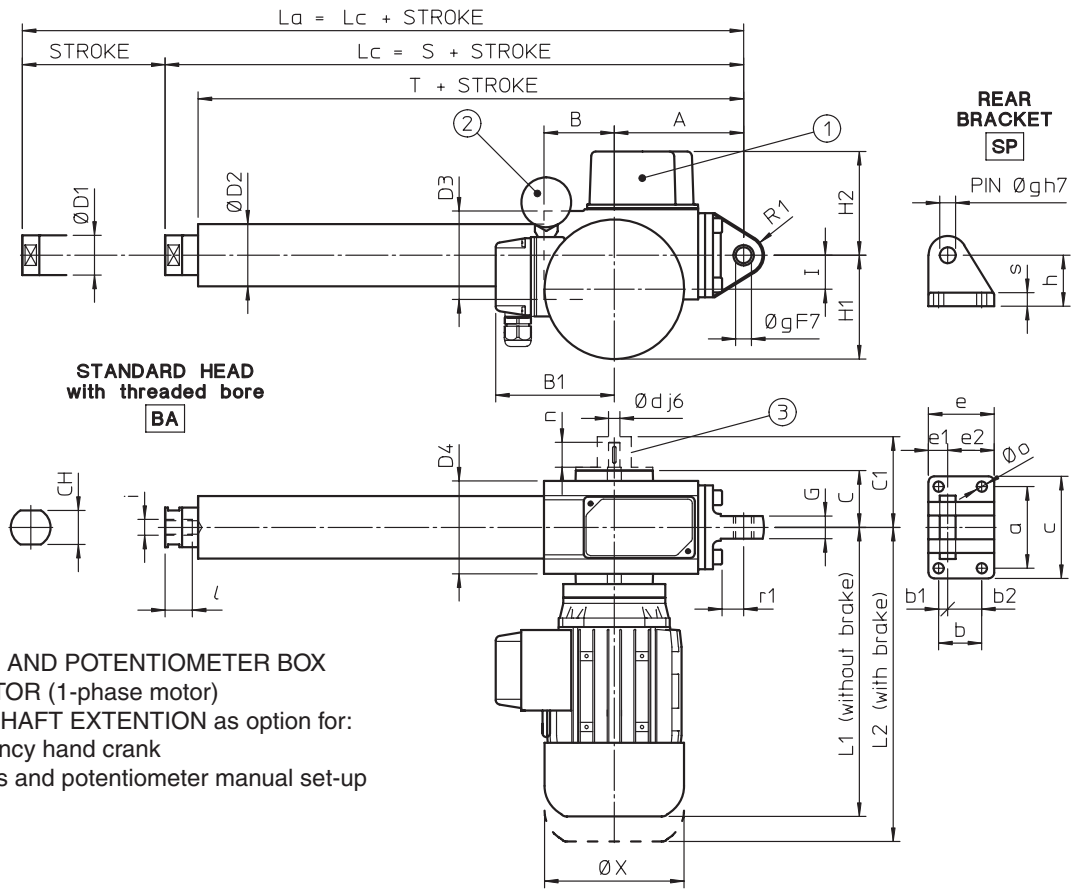
Execution with ball screw dia. 14 × lead 5 (code CLB 25) available on request. Ask for dimensions and performances.

Execution with ball screw dia. 16 × lead 5 (code CLB 25 S) available on request. Ask for dimensions and performances.

ORDERING EXAMPLE

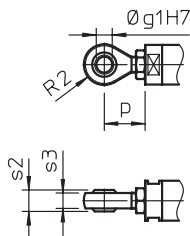
CLA 25	RL1	C200	ROE	FC2	POR 5k	A1	230 V 50 Hz	RH	RPT 90
Series and size	Ratio	Stroke	Front attachment	Stroke end switches	Rotative potentiometer	Rear attachment	Motor	Motor mounting	Fixing ends rotated 90°

OVERALL DIMENSIONS

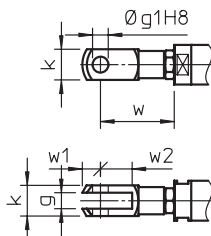


FRONT ATTACHMENT

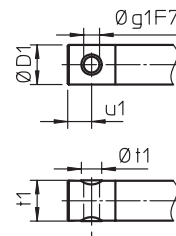
BALL JOINT (TS)
(CLA 30-40-50)



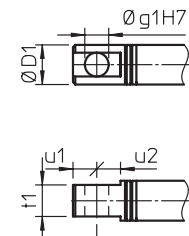
CLEVIS END (FO)
(CLA 30-40)



ROD END (ROE)
(CLA 30-40)



HINGED HEAD (TF)
(CLA 50)



$L_c = Q + \text{STROKE}$

$L_c = Q + \text{STROKE}$

	A	B	B1	C	C1	CH	Ø D1	Ø D2	D3	D4	G	H1	H2
CLA 30	114	62	115	50	80	30	35	55	78	82	20	92	90
CLA 40	128.5	78	124	57	95	36	40	60	92	103	24	115	97
CLA 50	142.5	80.5	141	57	95	46	50	70	102	100	40	118	101

	l	L1	L2	R1	S	T	Ø X	Ø d	Ø g	Ø i	l	n	r1
CLA 30	30	255	291	18	260	231	123	10	14	M14x2	24	22	19
CLA 40	40	264	373	28	304	266	150	14	20	M20x1.5	27	30	20
CLA 50	40	304	346	40	367	288	170	14	25	M30x2	45	30	40

	a	b	b1	b2	c	e	e1	e2	h	o	s
CLA 30	72	38	8	30	90	58	18	40	45	9	12
CLA 40	82	55	15	40	110	81	28	53	58	11	15
CLA 50	140	105	22	83	180	140	40	100	100	13	23

	Ø D1	Q	R2	g	Ø g1	k	p	s2	s3	t1	Ø t1	u1	u2	w	w1	w2
CLA 30	35	266	18	14	14	27	36	19	14	36	18	21	-	65	16	28
CLA 40	40	316	25	20	20	40	53	25	18	42	25	27	-	90	25	40
CLA 50	50	397	35	-	30	-	65	37	25	40	-	30	30	-	-	-

CLA 30 - PERFORMANCES with AC motor 3-phase 230/400 V 50 Hz or 1-phase 230 V 50 Hz						
SPEED [mm/s]	MAX. LOAD [N]		RATIO	MOTOR POWER [kW]	N° OF POLES	SPEED [rpm]
	3-phase motor	1-phase motor				
46	2 550	2 350	RV1	0.25 kW	2-pole	2 800 rpm
23	5 200	4 800	RN2	0.25 kW	2-pole	2 800 rpm
15	6 850	6 300	RL2	0.25 kW	2-pole	2 800 rpm
11	7 500	6 950	RN1	0.25 kW	2-pole	2 800 rpm
7.5	8 000	8 000	RL1	0.25 kW	2-pole	2 800 rpm
5.5	8 000	8 000	RN1	0.18 kW	4-pole	1 400 rpm
4	8 000	8 000	RL1	0.18 kW	4-pole	1 400 rpm

CLA 40 - PERFORMANCES with AC motor 3-phase 230/400 V 50 Hz or 1-phase 230 V 50 Hz						
SPEED [mm/s]	MAX. LOAD [N]		RATIO	MOTOR POWER [kW]	N° OF POLES	SPEED [rpm]
	3-phase motor	1-phase motor				
46	5 400	5 400	RV1	0.55 kW	2-pole	2 800 rpm
23	10 500	10 000	RN2	0.55 kW	2-pole	2 800 rpm
18	12 000	12 000	RL2	0.55 kW	2-pole	2 800 rpm
11	12 000	12 000	RN1	0.55 kW	2-pole	2 800 rpm
9	12 000	12 000	RL1	0.37 kW	4-pole	1 400 rpm
5.5	12 000	12 000	RN1	0.37 kW	4-pole	1 400 rpm
4.5	12 000	12 000	RL1	0.37 kW	4-pole	1 400 rpm

CLA 50 - PERFORMANCES with AC motor 3-phase 230/400 V 50 Hz						
SPEED [mm/s]	MAX. LOAD [N]		RATIO	MOTOR POWER [kW]	N° OF POLES	SPEED [rpm]
	3-phase motor	1-phase motor				
56	8 800		RV1	1.1 kW	2-pole	2 800 rpm
28	16 800		RN2	1.1 kW	2-pole	2 800 rpm
22	19 600		RL2	1.1 kW	2-pole	2 800 rpm
14	24 600		RN1	1.1 kW	2-pole	2 800 rpm
11	25 000		RL1	1.1 kW	2-pole	2 800 rpm
7	25 000		RN1	0.75 kW	4-pole	1 400 rpm
5.5	25 000		RL1	0.75 kW	4-pole	1 400 rpm

GENERAL FEATURES

- Push rod in chrome-plated steel
- 3-phase 230/400 V 50 Hz or 1-phase 230 V 50 Hz motor (on CLA30 or CLA 40) standard protection IP 55
- Max. duty cycle: 30 % over 10 min at (- 10 ... + 40)°C
- Standard motor mounting position as on the sketch (right-hand, code RH)
- Long life lubrication, maintenance free

CLA 30 - 40 - PERFORMANCES AND FEATURES

- Push and pull load up to 8 000 N (CLA 30) ... 12 000 N (CLA 40)
- Linear speed up to 46 mm/s
- Standard strokes: 100, 200, 300, 400, 500 mm
- Housing and rear attachment in aluminium alloy
- External tube in anodized aluminium

CLA 30, CLA 40 - OPTIONS

- Fixing ends rotated through 90° (code RPT 90)
- 24 or 12 V DC motor, standard protection IP 54

Execution with ball screw dia. 20 × lead 5 (code CLB 30) available on request. Ask for dimensions and performances.

Execution with ball screw dia. 25 × lead 6 (code CLB 40) available on request. Ask for dimensions and performances.

GENERAL OPTIONS

- Rear bracket (code SP)
- Anti-turn device (code AR)
- Mechanical overload protection: safety clutch (code FS)
- Input shaft extension (code Vers.4)
- Brake-motor
- Motor mounted on opposite side (left-hand, code LH)
- Two adjustable cam-operated electric switches (code FC2)
- Third switch for intermediate position (code ... + FC)
- Positioning control with rotative potentiometer 5 kΩ (code POR 5k)
- Positioning control with incremental rotative encoder (code ENC 4) 4 ppr, PUSH-PULL

CLA 50 - PERFORMANCES AND FEATURES

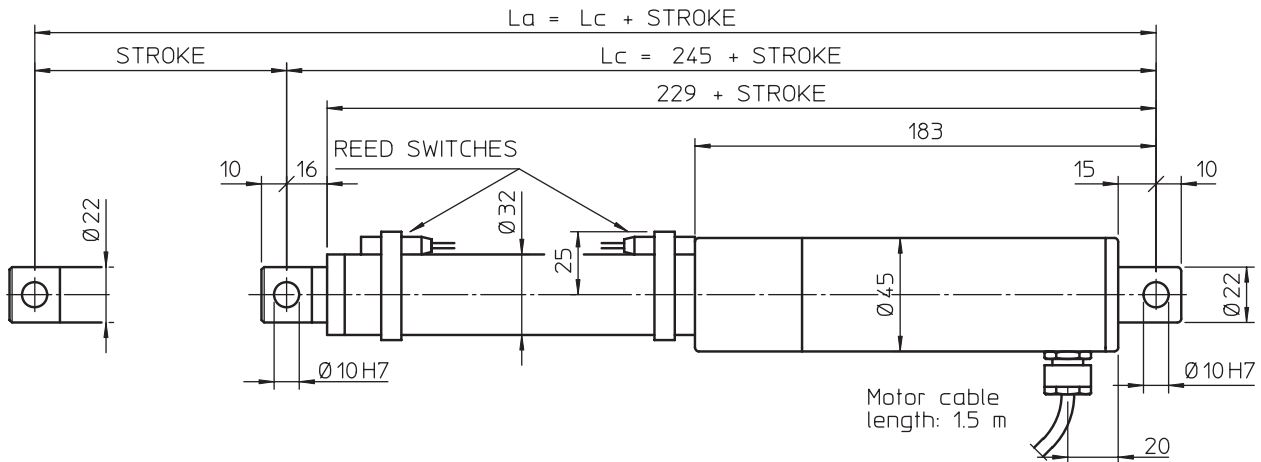
- Push and pull load up to 25 000 N
- Linear speed up to 56 mm/s
- Standard strokes: 100, 200, 300, 400, 500, 600 mm
- Housing in cast iron
- External tube in steel

Execution with ball screw dia. 32 × lead 10 (code CLB 50) available on request. Ask for dimensions and performances.

ORDERING EXAMPLE

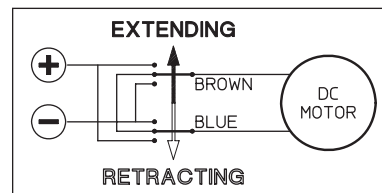
CLA 30	RL1	C300	FO	FC2	POR 5k	0.25 kW 2-pole 230/400 V 50 Hz	RH	RPT 90	SP
Series and size	Ratio	Stroke	Front attachment	Stroke end switches	Rotative potentiometer	Motor	Motor mounting	Fixing ends rotated 90°	Rear bracket

OVERALL DIMENSIONS

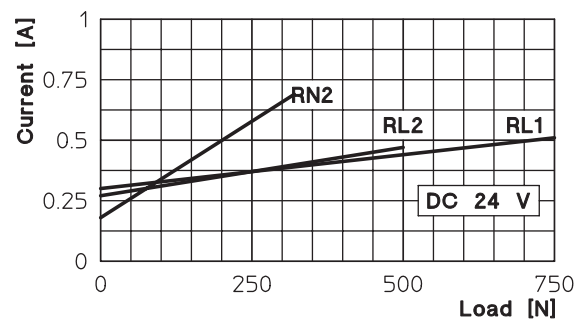
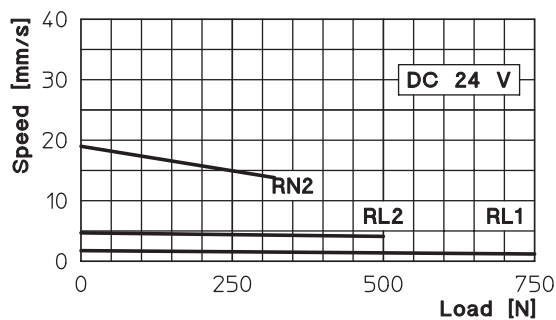


STROKE CODE	LENGTH		WEIGHT [kg]
	Lc [mm]	La [mm]	
C100	345	445	1.05
C150	395	545	1.30
C200	445	645	1.55
C250	495	745	1.80
C300	545	845	2.05

MOTOR WIRING



PERFORMANCES with 24 V DC motor



Performances with 12 V DC motor: same load - speed 10 % less, current 2 times

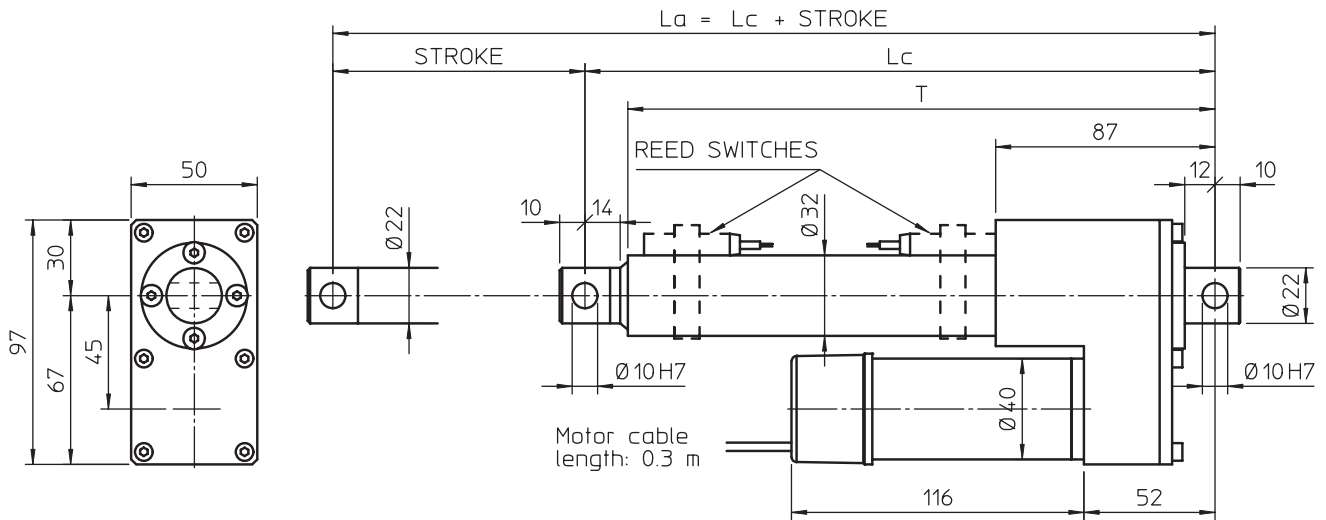
PERFORMANCES, FEATURES AND OPTIONS

- Push and pull load up to 750 N
- Linear speed up to 19 mm/s
- Standard strokes: 100, 150, 200, 250, 300 mm
- Rear attachment in aluminium alloy
- Housing and external tube in anodized aluminium
- Push rod in anodized aluminium
- Front attachment in stainless steel AISI 303
- 12 or 24 V DC motor, standard protection IP 65
- Max. duty cycle: 15 % over 10 min at (-10 ... +40)°C
- Long life lubrication, maintenance free
- Two adjustable magnetic switches (code FCM)
- One or more magnetic switches for intermediate position

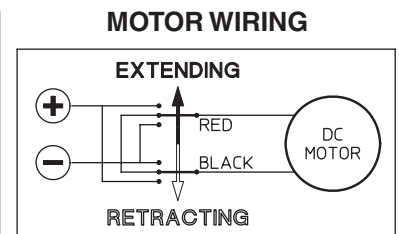
ORDERING EXAMPLE

LMI 02	RL1	C200	FCM	DC 24 V
Series and size	Ratio	Stroke	Stroke end switches	Motor

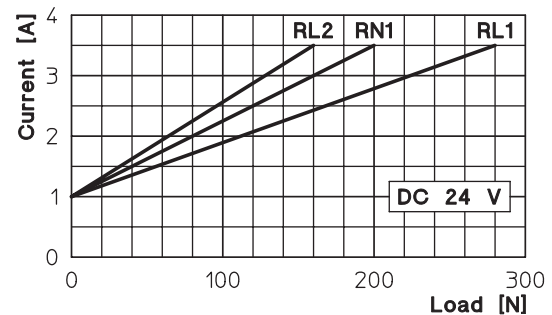
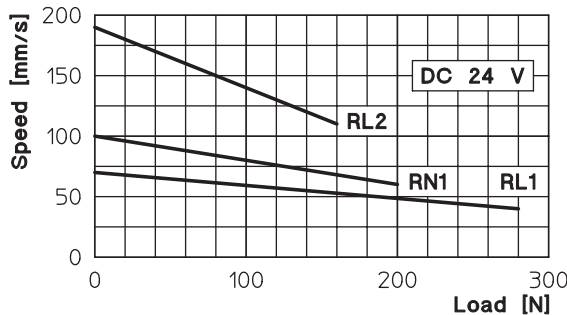
OVERALL DIMENSIONS



STROKE CODE	STROKE [mm]	Actuator without FCM			Actuator with FCM			WEIGHT [kg]
		L_c [mm]	L_a [mm]	T [mm]	L_c [mm]	L_a [mm]	T [mm]	
C100	100	218	318	201	252	352	233	1.30
C150	150	268	418	251	302	452	283	1.55
C200	200	318	518	301	352	552	333	1.80
C250	250	368	618	351	402	652	383	2.05
C300	300	418	718	401	452	752	433	2.30



PERFORMANCES with 24 V DC motor



Performances with 12 V DC motor: same load - speed 10 % less, current 2 times

PERFORMANCES AND FEATURES

- Push and pull load up to 280 N
- Linear speed up to 190 mm/s
- Standard strokes: 100, 150, 200, 250, 300 mm
- Housing in aluminium alloy
- External tube in anodized aluminium
- Push rod in anodized aluminium
- Front attachment in stainless steel AISI 303
- 12, 24 or 36 V DC motor with electromagnetic noise suppressor, standard protection IP 30
- Max. duty cycle: 15 % over 10 min at (-10 ... +40)°C
- Long life lubrication, maintenance free

OPTIONS

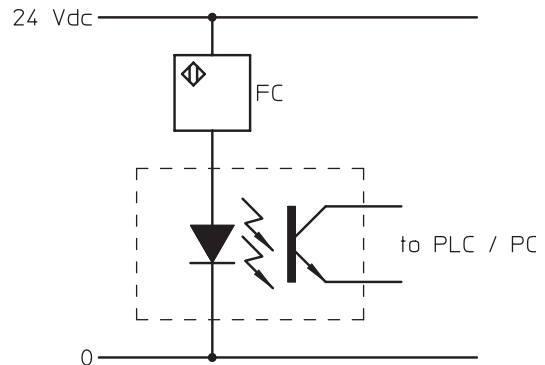
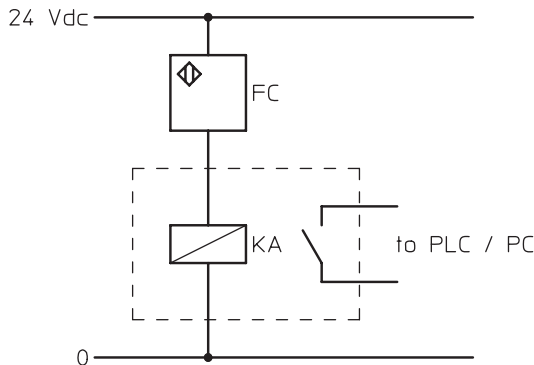
- Fixing ends rotated through 90° (code RPT 90)
- Two adjustable magnetic switches (code FCM)
- One or more magnetic switches for intermediate position
- Encoder on motor shaft
1 ppr (code GI 21) or 4 ppr (code GI 24), available on request (min. order quantity: 50)

ORDERING EXAMPLE

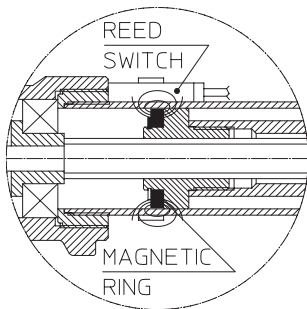
LMP 03	RL1	C200	FCM	DC 24 V	RPT 90
Series and size	Ratio	Stroke	Stroke end switches	Motor	Fixing ends rotated 90°

GENERAL NOTES

When stroke end switches of a linear actuator are connected to PLC or PC, it is highly recommended that they are connected into a galvanic insulation circuit:



Stroke end reed switches FCM (linear actuators ATL Series, LMI 02 and LMP 03)



A magnetic ring is fixed to the travelling bronze nut and the magnetic field activates the reed switches, which are fixed via clamps on the outer tube.

The reed switch position can be adjusted along the outer tube.

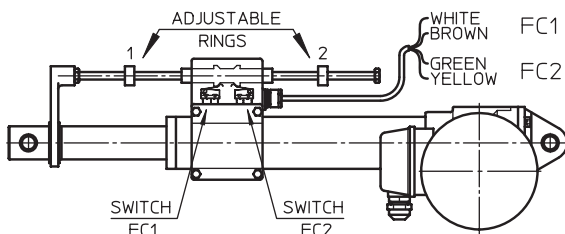
If one or more reed switches are used in order to have intermediate positions, then depending on the actuator direction of travel, the switch will signal in two different positions.

WARNING! The reed switches should be connected via control circuitry to activate an electric relay. Do not directly wire in series between the power supply and the electric motor!

REED SWITCH RATED VALUES		
	DC	AC
Rated voltage	(3 ... 130) V	(3 ... 130) V
Max. power	20 W	20 VA
Max. current	300 mA (resistive load)	
Max. inductive load	3 W	

Cable length: 2 m; wires: 2 × 0.75 mm²

Electric stroke end switches FCE (linear actuator ATL 12)



Two adjustable brass rings activate electric switches, installed inside a sealed aluminium alloy box.

MIN. RETRACTED LENGTH is adjusted by RING 1 and controlled by SWITCH FC1.

MAX. EXTENDED LENGTH is adjusted by RING 2 and controlled by SWITCH FC2.

The position of brass rings can be adjusted along the stainless steel rod.

WARNING! The electric switches should be connected via control circuitry to activate an electric relay. Do not directly wire in series between the power supply and the electric motor!

SWITCH RATED VALUES		
Voltage	Max. current	
	Resistive load	Inductive load
250 Vac	5 A	3 A
30 Vdc	5 A	0.1 A
125 Vdc	1.4 A	-

Cable length: 1.5 m; wires: 4 × 0.75 mm²

Electric stroke end switches FC (linear actuators LMR Series)

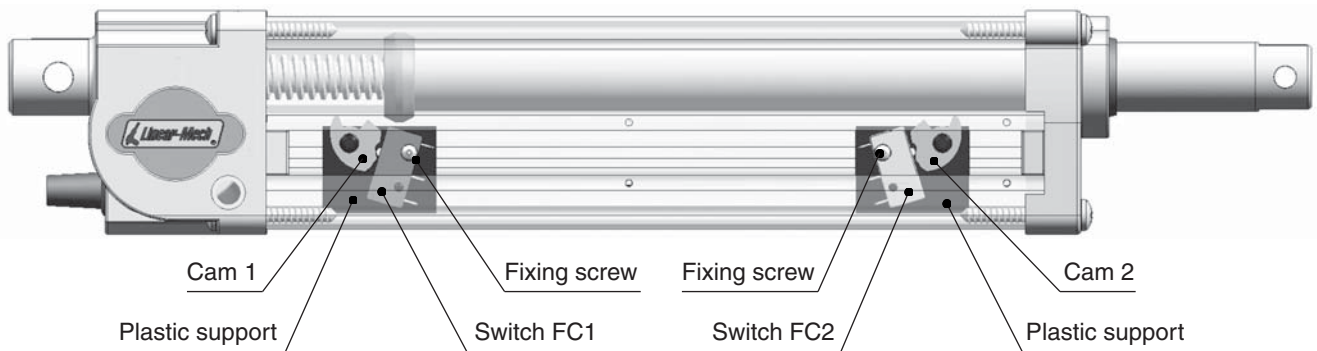
A plastic support is used to fix every of two electric cam-operated switches inside the actuator aluminium body. The switches and supports are held in place via a fixing screw.

This method allows easy and accurate adjustment to any axial position within the actuator body, simply by loosening and tightening the fixing screw.

The bronze nut profile activates the cams and switches accordingly.

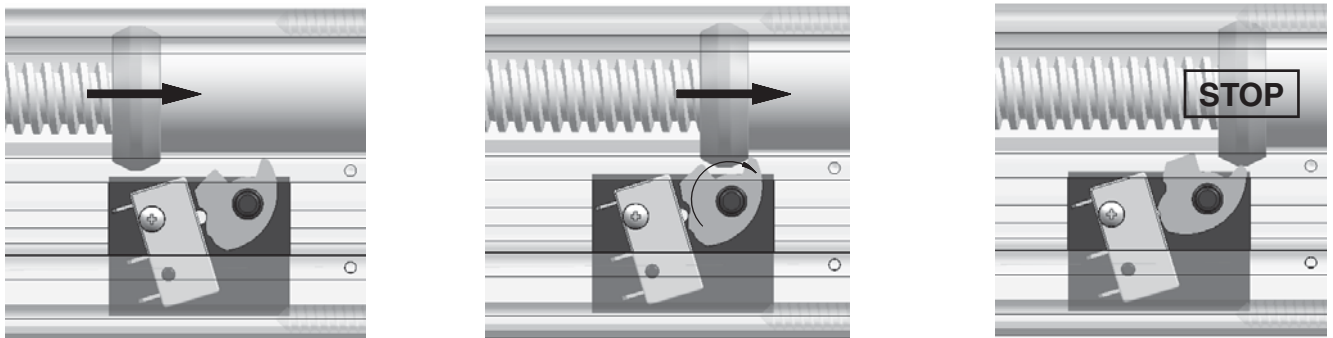
MIN. RETRACTED LENGTH is adjusted and controlled by SWITCH FC1.

MAX. EXTENDED LENGTH is adjusted and controlled by SWITCH FC2.



Standard switches are silver-plated contacts, max. current 12 A with resistive load - 6 A with inductive load.

The following images show a switching sequence for switch FC 2.



Standard switch connection

Code **FC2**: two electric cam-operated stroke end switches, not internally wired (prepared to be connected into a controll circuit).

MOTOR

RED (0.75 mm²)

BLACK (0.75 mm²)

FC 1

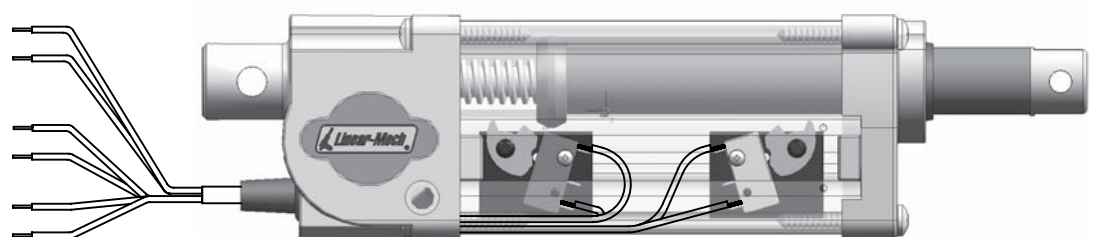
RED (0.22 mm²)

WHITE (0.22 mm²)

FC 2

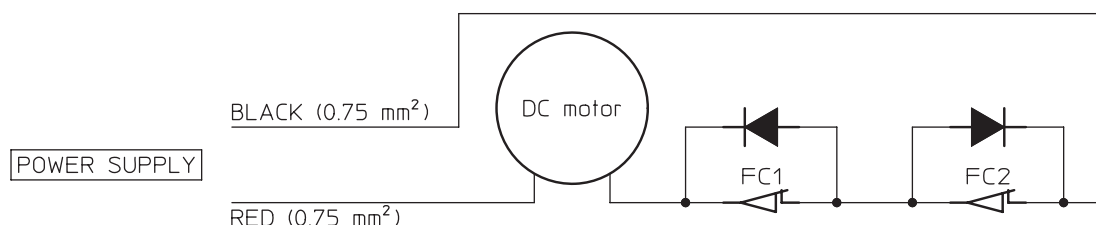
YELLOW (0.22 mm²)

GREEN (0.22 mm²)



Gold-plated contact switches offer low contact resistance, for working with low voltage when connected to a PLC or PC, and are available on request (max. current 0.1 A).

Code **FC2X**: two electric cam-operated stroke end switches are internally wired between power supply and motor, and are used to switch the motor off directly, without the need of relays.



Electric stroke end switches (linear actuators CLA Series)

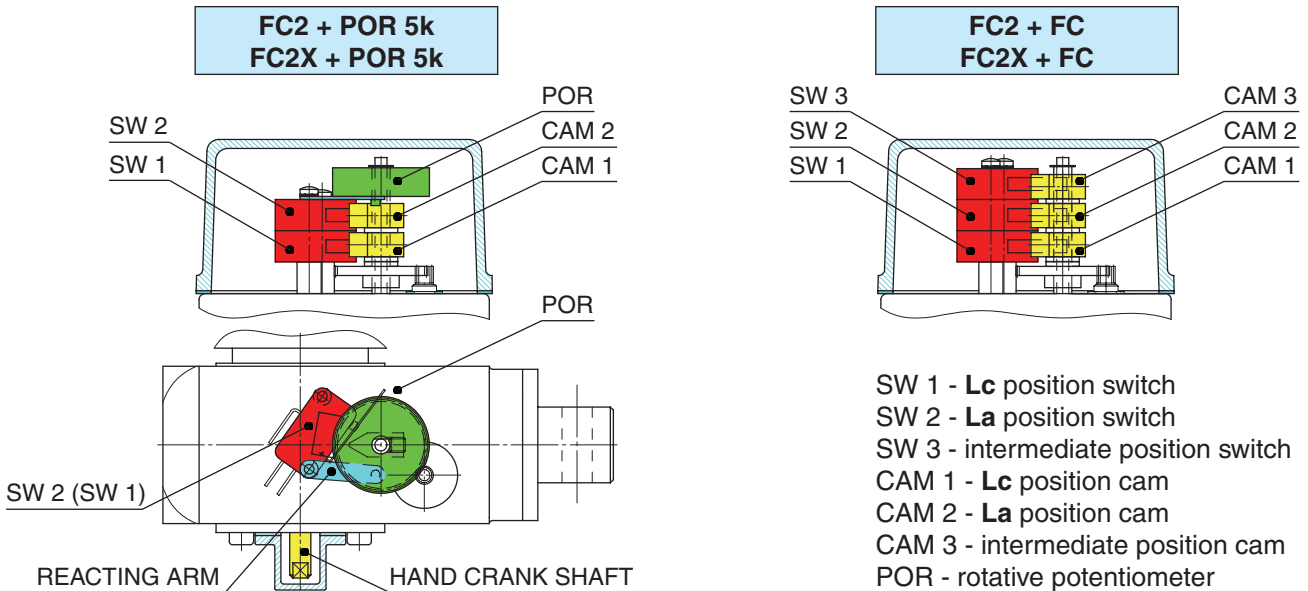
Code **FC2**: two electric cam-operated stroke end switches, not internally wired (should be connected into a control circuit)

Code **FC2X**: two electric cam-operated stroke end switches, internally wired between power supply and motor, and are used to switch the motor off directly without the need of relays, available for DC and AC 1-phase motors

Code **FC2 + FC** or **FC2X + FC**: as above, but a with third switch for intermediate position switching.

SWITCH RATED VALUES		
Voltage	Max. current	
	Resistive load	Inductive load
250 Vac	21 A	12 A
30 Vdc	14 A	12 A
125 Vdc	0.8 A	0.6 A

Cable length: 1.5m; for wire colors, see the connection diagram on the Installation instructions sheet attached to the product



Lc - retracted actuator length, La = Lc + STROKE - extended actuator length (see pages 10, 11, 12 or 14)

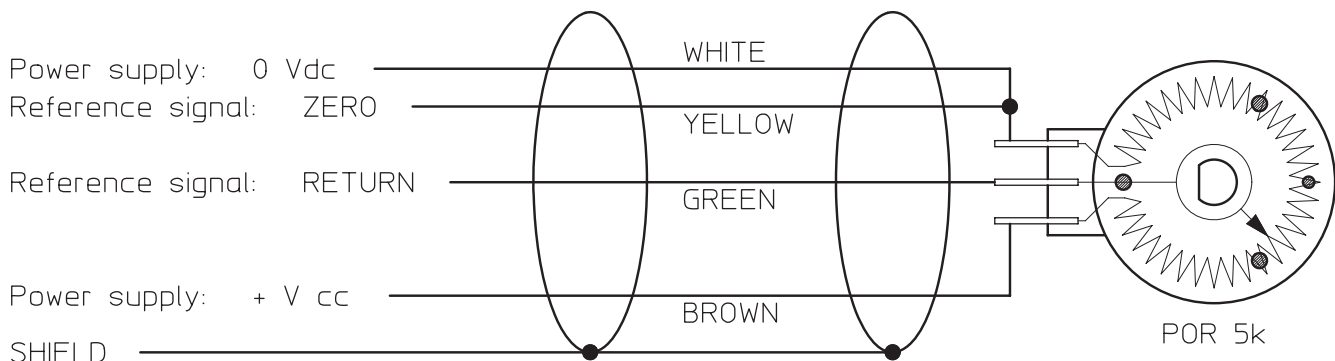
ROTATIVE POTENTIOMETER for position control (linear actuators CLA Series)

Code **POR 5k**: rotative potentiometer, single turn 340°, 5 kOhm ± 20 %, linearity ± 2 %.

Rotative potentiometer is an absolute transducer, whose output signal is proportional to the current position of the actuator push rod. The output is a (0 ... +) V dc analogue signal.

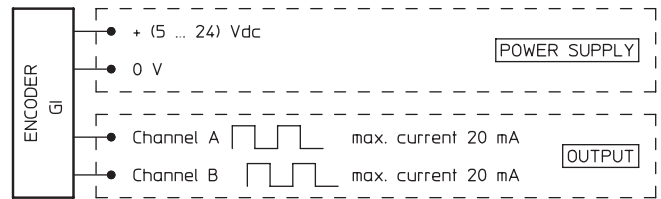
Standard cable: 4 × 0.25 mm² + shield, 1.5 m long

Recommended connection diagram:



Encoder GI (linear actuators LMR 01 and LMR 03)

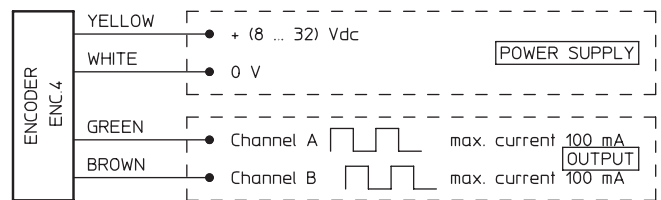
Hall-effect encoder, incremental, bidirectional
 Output configuration: PUSH-PULL
 Code GI 21: 2 output channels, 1 ppr
 Code GI 24: 2 output channels, 4 ppr
 Cable length: same as motor cable length
 Protected against power supply polarity inversion
 Protected against any incorrect output connection



NOTE: For wire colors, see wiring diagram on Installation instructions sheet!

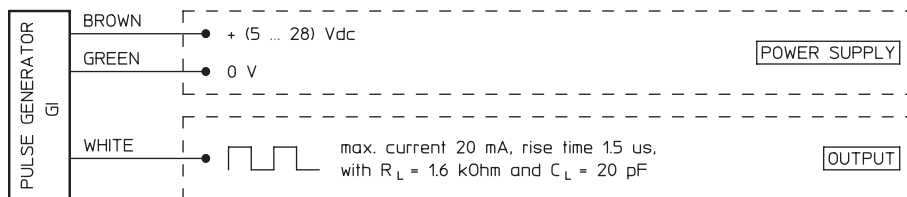
Encoder ENC.4 (linear actuators CLA 30, CLA 40 and CLA 50)

Hall-effect encoder, incremental, bidirectional
 Output configuration: PUSH-PULL
 Code ENC.4: 2 output channels, 4 ppr
 Cable length: 1.3 m
 Protected against short circuit
 Protected against power supply polarity inversion
 Protected against any incorrect output connection
 Max. output voltage drop, with load connected to 0 and $I_{out} = 100 \text{ mA}$: 4.6 V
 Max. output voltage drop, with load connected to + V und $I_{out} = 100 \text{ mA}$: 2 V



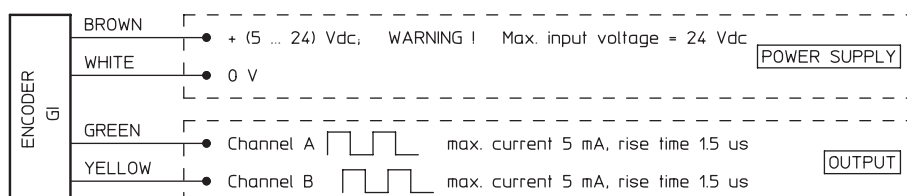
Pulse generator GI (linear actuators ATL 05 and ATL 08)

Hall-effect pulse generator
 Output configuration: NPN OPEN COLLECTOR
 Code GI 11: 1 output channel, 1 ppr
 Code GI 13: 1 output channel, 3 ppr
 Cable length: same as motor cable length

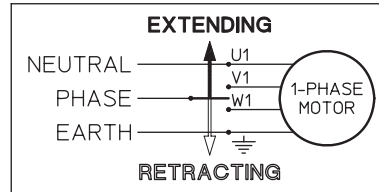
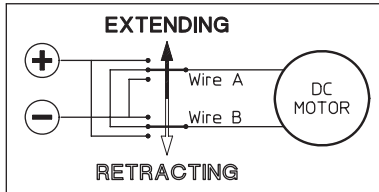


Encoder GI (linear actuator ATL 12)

Hall-effect encoder, incremental, bidirectional
 Output configuration: OPEN COLLECTOR
 Code GI 21: 2 output channels, 1 ppr
 Code GI 23: 2 output channels, 3 ppr
 Cable length: same as motor cable length



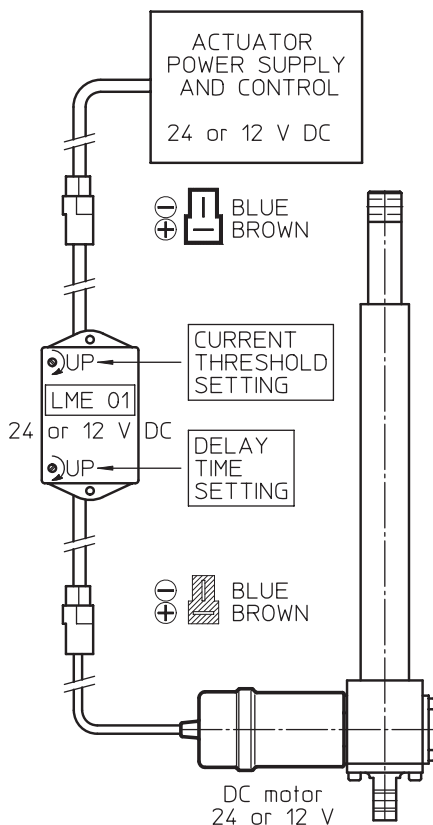
Motor WIRES CONNECTION - Actuator push rod TRAVELLING DIRECTION



Actuator with DC motor, RIGHT-HAND mounted	LMR 01	LMR 03	ATL 02	ATL 05	ATL 08	ATL 12	CLA 20	CLA 25
Color of wire A	red	red	brown	brown	brown	black	brown	brown
Color of wire B	black	black	blue	blue	blue	brown	blue	blue

Actuator with DC motor, LEFT-HAND mounted	LMR 01	LMR 03	ATL 02	ATL 05	ATL 08	ATL 12	CLA 20	CLA 25
Color of wire A	red	red	blue	blue	blue	brown	blue	blue
Color of wire B	black	black	brown	brown	brown	black	brown	brown

LME 01 - Overload protection



LME 01 is an electronic device that protects the DC motor against overcurrent caused by persistent dynamic overload applied to the actuator. It is suitable for use with all LINEAR-MECH actuators fitted with a DC motor.

LME 01 is installed between actuator motor and its power supply. An electronic circuit monitors motor current and, as the motor current reaches the set value, **LME 01** disconnect the power. A trimmer enables adjustment of the maximum current value within a continuous range.

The protection intervention can be delayed to allow for motor starting current. The time delay can be adjusted within a continuous range by a trimmer.

Turn off power supply to reset device.

The electronic circuit is housed inside a plastic box for simple mounting.

TEHNICAL DATA		
Model (power supply)	24 V	12 V
Supply voltage [V dc]	24	12
Output voltage [V dc]	24	12
Current threshold range [A]	2 ... 10	4 ... 20
Delay time range [s]	0 ... 1.5	
Max. duty cycle	15 % over 10 min	
Protection class	IP 30	
Box material	ABS	
Box dimensions [mm]	89 × 64 × 30	
Connection cables 150 mm long, with fast-on connectors		

ORDERING EXAMPLE

LME 01	24 V	ATL 02
	Model	Actuator, LME 01 will work with

LME 11 - Programmable drive and control unit for single actuator

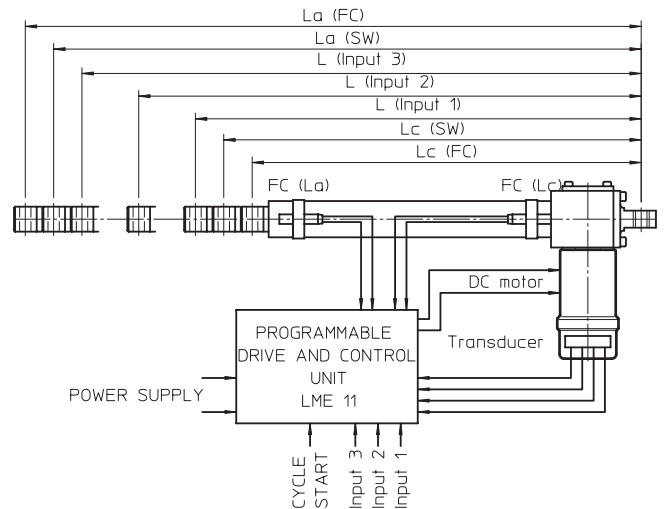
LME 11 is a programmable drive and control unit for a single linear actuator with DC motor. It allows a user to control the actuator push rod position, max. linear speed, starting - stopping ramp time and max. force. Two stroke end switches prevent over-run at the end of the stroke. A current limit function prevents overload during the linear motion; the current threshold and cut-off delay time can be set by a trimmer.

LME 11 can control a linear actuator with a DC motor fitted with two normally closed stroke end switches and a feedback device, such as rotative potentiometer (single turn, 5 k Ω) or bi-directional encoder or 1-channel pulse generator (PUSH-PULL or OPEN COLLECTOR, max. 1 kHz)

The linear actuator can operate in different ways, depending on software parameters values. As standard, the LME 11 unit is supplied with three pre-programmed, closed loop working modes which can be selected.

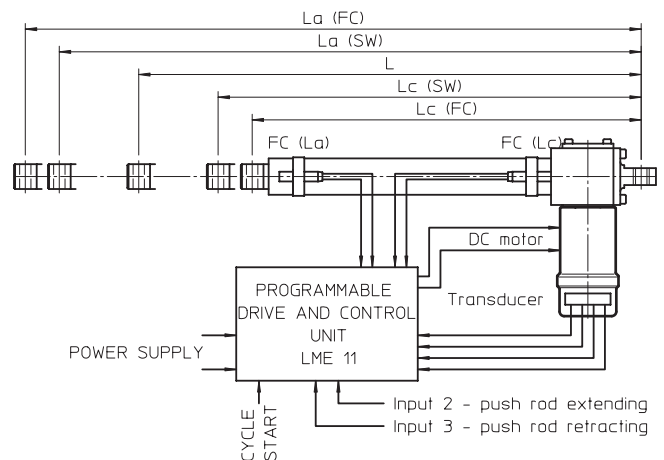
Working mode 0 (pre-programmed positions):

using **Input 1**, **Input 2** or **Input 3**, three pre-defined positions **L (Input N)** can be selected. The values set are limited by two software limits **Lc (SW)** and **La (SW)**, within the range set by two stroke end switches **Lc (FC)** and **La (FC)**; the actuator moves to position when the **CYCLE START** and **Input N** are enabled and stops automatically when the push rod reaches the required position **L (Input N)**;



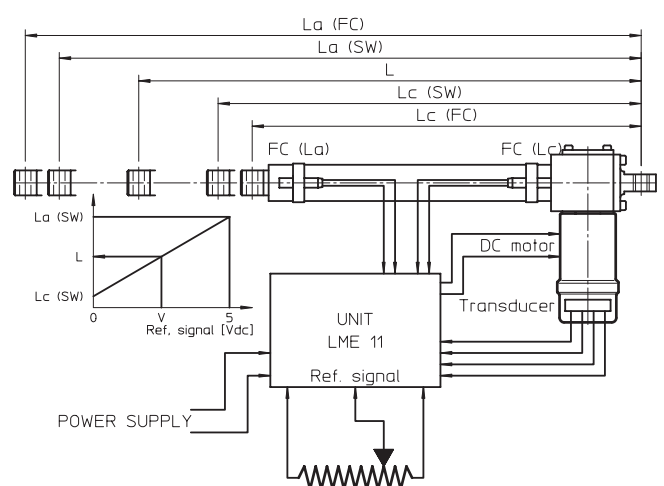
Working mode 1 (JOG mode):

enabling **Input 2** or **Input 3** allows any position of the actuator push rod **L** to be achieved. However, limits are two software limit positions **Lc (SW)** and **La (SW)**, within the range set by two stroke end switches **Lc (FC)** and **La (FC)**; the actuator moves to position when the **CYCLE START** and **Input n** are enabled and stops automatically as soon as they are disabled;



Working mode 2 (external positioning):

positioning of the actuator push rod in any position **L** is achieved by the use of an external, analogue reference signal. A potentiometer or any device with a (0 ... 5) V dc or (4 ... 20) mA output signal can be used. As the reference signal is varied, the actuator moves to the required position. However, limits are two software limit positions **Lc (SW)** and **La (SW)**, within the range set by two stroke end switches **Lc (FC)** and **La (FC)**.



Other working modes are available, however, please, contact us for details.

All software parameter values can be varied using an additional display (optional available on request) or through the MODBUS communication port.

LME 11 - Programmable drive and control unit for single actuator

TECHNICAL CHARACTERISTICS:

- Nominal input voltage: 26 V dc (for 24 V dc motors) or 14 V dc (for 12 V dc motors)
- Input voltage limits: (10 ... 30) V dc
- Low voltage protection (important when the power supplier is a battery)
- Protected against power supply polarity inversion
- Max. motor current: 10 A
- Thermal overload protection
- EMERGENCY STOP input
- CYCLE START input
- 3 positioning comand inputs
- Analogue input (V or mA)
- Encoder input (max. frequency 1 kHz)
- MODBUS communication port
- Status output for system functioning monitoring
- Signal LEDs
- Dimensions: 144 × 107 × 76 mm
- Fixing on rail DIN-EN 50022

LME 12 - Programmable drive and control unit for two actuators

LME 12 is a programmable drive and control unit for synchronising two DC motor driven linear actuators, with each motor fitted with a feedback device.

LME 12 is a unique board which integrates two LME 11 units: each actuator has a separate microprocessor and can be programmed individually.

Based on parameter set, **LME 12** calculates the actuator push rod position as function of time. The unit allows two actuators to start simultaneously and, using the information from the motor feedback devices, monitors their push rod position.

The system will stop automatically and an error signal will be generated in two cases:

- when a pre-programmed error value is exceeded, as this is used to compare the actual position of either push rod and the relative calculated position, or
- when a pre-programmed error value is exceeded between the two push rods.

Two units **LME 12** can be connected in 4-axis system.

Dimensions: 116 × 160 × 76 mm

For working modes and technical characteristics: see chapter about LME 11.

