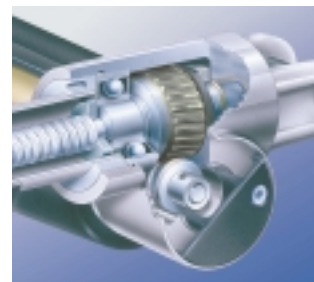


CAT Modular Range

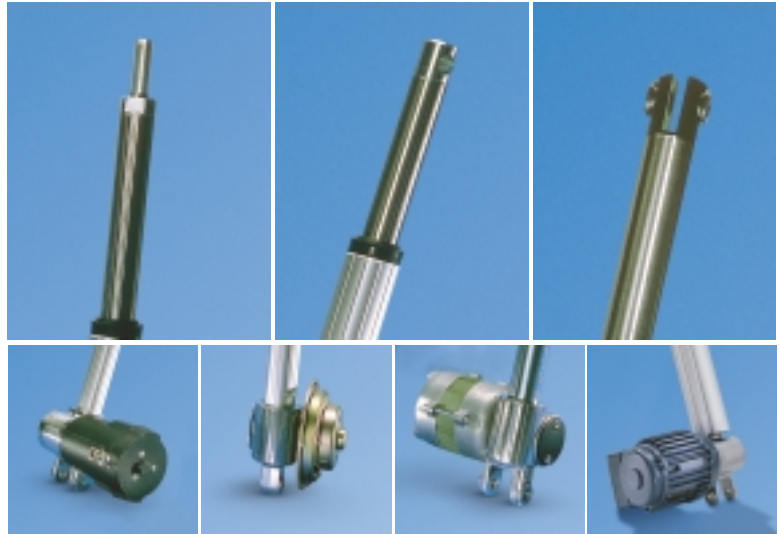


Concept of CAT Modular Range

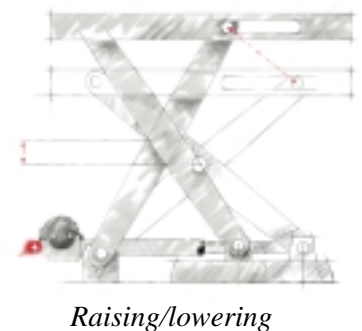
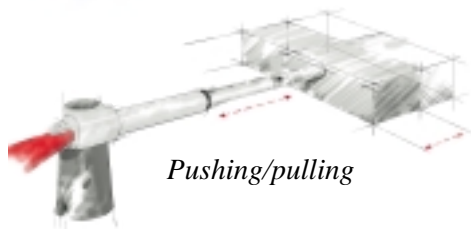
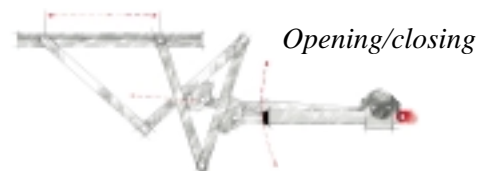
The CAT modular design concept makes it easy to interchange critical components such as motors, gears, screws, attachments, etc. Custom built actuators are easily and cost efficiently built from standard parts. The CAT range flexibility makes it suitable for an infinite number of applications. All actuators are maintenance free.

Options:

- AC or DC-motors, 13 different alternatives
- Ball or sliding screw
- 3 different screw pitches
- 3 different gear ratios
- 7 standard stroke lengths up to 700 mm
- Special stroke lengths up to 1500 mm.
- Friction clutch gears
- IP 44 or IP 65
- EMC filters (EN 50 081-1 and EN 55 022)
- Range of front and rear attachments
- Limit switches

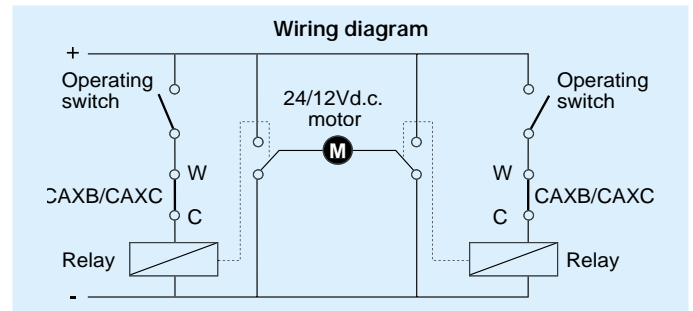


Typical applications



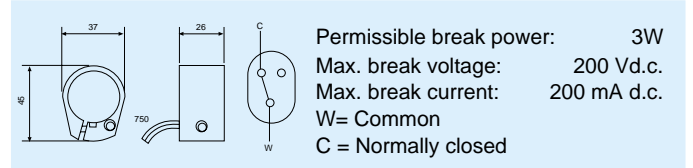
Limit switches

- Proximity switches - connect to control card according to the wiring diagram.
- Max. current allowed through the switch is 200 mA (d.c.).
- CAXC 33 - designed for CAT 33/33H (aluminum protection tube).
- CAXB 32B - designed for CAT 32B (steel protection tube).



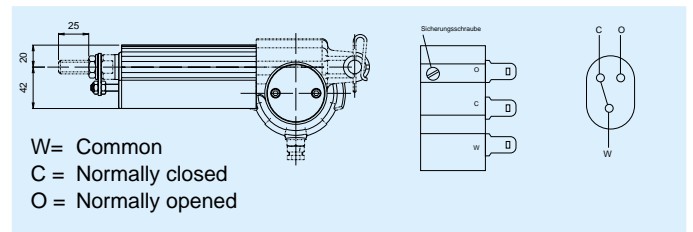
CAXC 33

- Two CAXC needed for inner and outer limit.
- The switches reduces the effective stroke length by 20 mm.



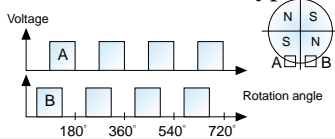
CAXB 32B

- For avoiding running into mechanical end stop, the limit switches should be located approximately 10 mm from respective end stop.
- Front attachment G3 must be selected for this option.



Feedback-Encoder

- Hall effect, two channels with 45° displacement.
- Located on motor shaft.
- 2 pulses/channel and motor revolution.
- Final resolution according to gear ratio and actuator basic type. See table.

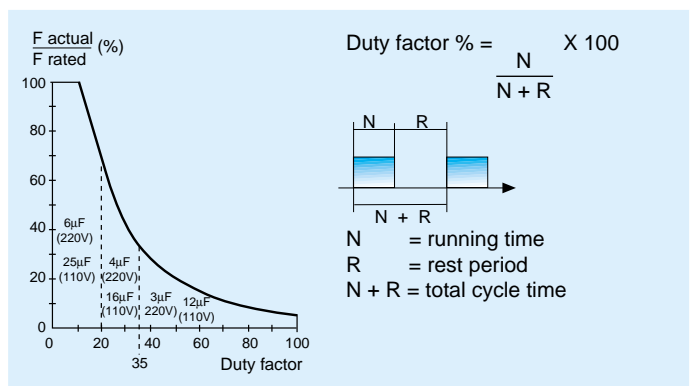


	Gear	Pulses/mm	Resolution/pulse
CAT 33	1	16.67	0.06
	2	8.33	0.12
	4	4.17	0.24
CAT 33H	1	4.00	0.25
	2	2.00	0.50
	4	1.00	1.00
CAT 32B	1	12.50	0.08
	2	6.25	0.16
	4	3.13	0.32

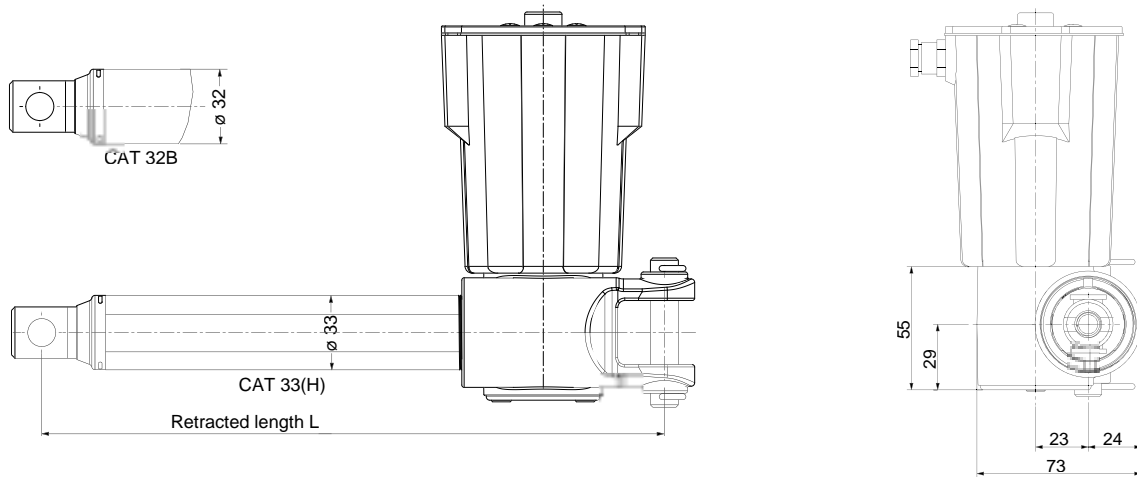
Supply voltage: 4.5 - 24Vd.c. Current output: Max 12.5mA

Duty factor

- Design for intermittent operation.
- Permitted load related to duty factor, e.g. the higher the load, the less the permitted duty factor.
- Duty factor is defined as running time under load versus total cycle time.
- The diagram shows load as function of duty cycle.
- For AC-motors the capacitor must be selected with respect to the duty cycle and load. Required capacitor size is indicated in diagram.

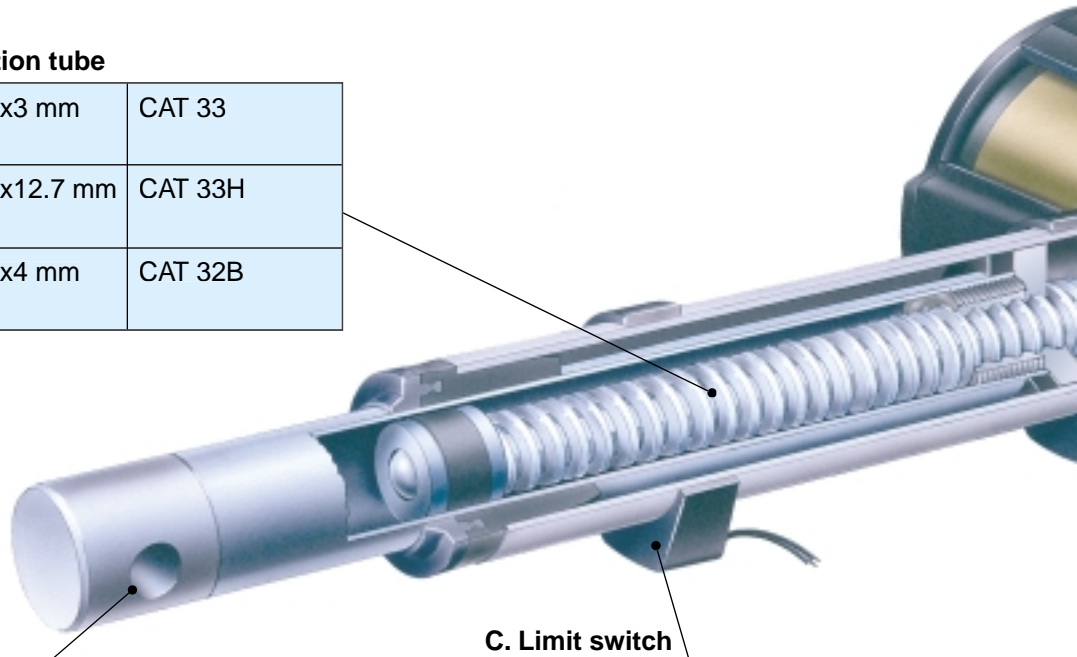


Combine your own actuator



A. Screw and protection tube

Sliding screw/ Aluminium tube	12.0x3 mm	CAT 33
Sliding screw/ Aluminium tube	12.7x12.7 mm	CAT 33H
Ball screw/ Steel tube	12.0x4 mm	CAT 32B



B. Front attachments and retracted length

	G1
	G2
	G3
	G4
	G5

* If S ≥ 400 add 50mm to retracted length.

C. Limit switch

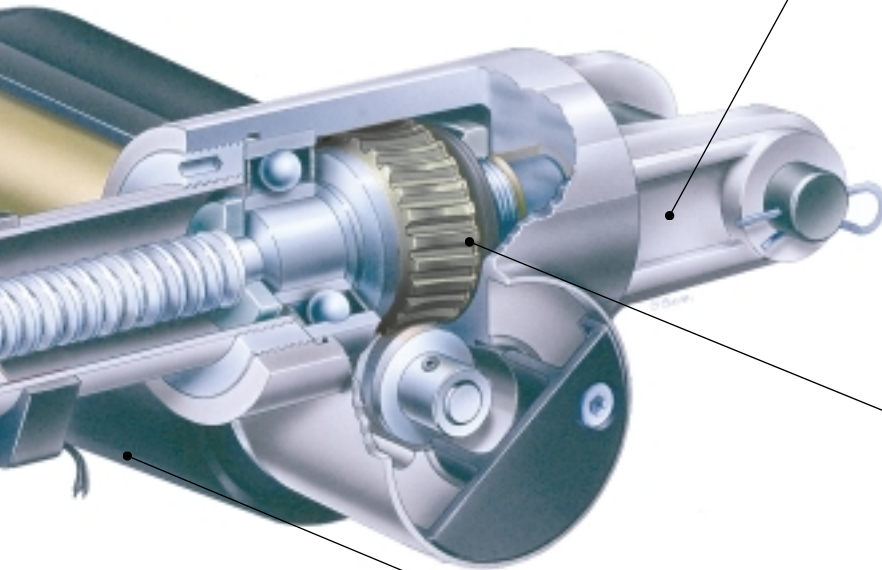
CAT 33/33H	CAXC 33
CAT 32B	CAXB 32B

D. Cables

No cable	U
	CxxCT2
	CxxCMET2
	CxxCT2P
	CxxCMET2P

F. Rear attachments

	A1
	A2
	K1
	K2



G. Gears

No. 1	Ratio 25:1	1
No. 2	Ratio 12.5:1	2
No. 4	Ratio 6.25:1	4

E. Motors

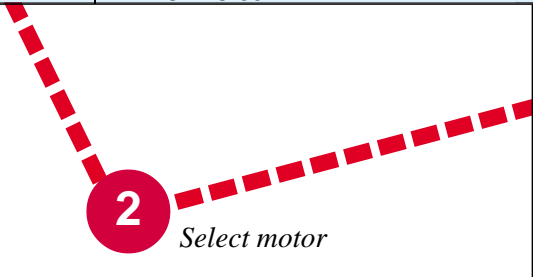
C12C C24C C24CW	C12CM C12CME C24CM C24CME C24CWM C24CWME	C12CN C24CN C24CWN	D12C D24C D24CB D24CS D24CW	E110C E110CB E220C E220CB	E380C

Combination chart -

Select mechanical features



		Suffix	CAT 33	CAT 33H	CAT 32B
Motor mounts	Left	L	●	●	●
	Right	R	●	●	●
Protection tube	Aluminium		●	●	
	Steel				●
Screw	Sliding		●	●	
	Ball				●
Stroke length	50 mm	50			●
	100 mm	100	●	●	●
	200 mm	200	●	●	●
	300 mm	300	●	●	●
	400 mm	400	●	●	●
	500 mm	500			●
	700 mm	700			●
	Special ⁴⁾			● ⁸⁾	● ⁸⁾
Gear	No.1	1	●	●	●
	No.2	2	●	●	●
	No.4	4	●	●	●
Rear attachments	Fork ear, Ø=12.0 mm	A1	●	●	●
	Fork ear, Ø=12.7 mm	A2	●	●	●
	Single ear, Ø=12.0 mm	K1	●	●	●
	Single ear, Ø=12.7 mm	K2	●	●	●
Front attachments	Hole, Ø=12.0 mm	G1	●	●	●
	Hole, Ø=12.7 mm	G2	●	●	●
	Male thread, M12x1.75	G3	●	●	●
	Female thread, M12x1.75	G4	●	●	●
	Fork ear, Ø=10.1 mm	G5	●	●	●
Option	Friction clutch	F	●	●	●
	No friction clutch ⁶⁾	Z	●	●	●
	Ball nut with back up device	S			●
Limit switch	CAXB 32B ¹⁾	CAXB			●
	CAXC 33 ⁵⁾	CAXC	●	●	

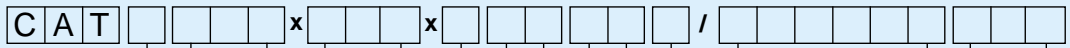


2 Select motor

Motor					
	Without motor	0000	●	●	●
	12Vd.c.	C12C	●	●	●
	24Vd.c.	C24C	●	●	●
	24Vd.c. low speed	C24CW	●	●	●
	12Vd.c. flat motor	D12C	●	●	●
	24Vd.c. flat motor	D24C	●	●	●
	24Vd.c. flat motor, brake	D24CB	●	●	●
	24Vd.c. flat motor, extended shaft	D24CS	●	●	●
	24Vd.c. flat motor, low speed	D24CW	●	●	●
	110Va.c.	E110C	●	●	●
	110Va.c. with brake	E110CB	●	●	●
	220Va.c.	E220C	●	●	●
	220Va.c. with brake	E220CB	●	●	●
	380Va.c.	E380C	●	●	●

- 1) Front attachment "G3" has to be used.
- 2) Option "M" has to be used.
- 3) Need cable with plug, select "T2P".
- 4) On request, please contact SKF for further information.
- 5) CAT 33H is not available with CAXC 33 when using gear no 2 and 4.
- 6) Standard when using encoder "E".
- 7) Always state type of cable when using IP65.
- 8) Customized stroke length available for S=50-400 mm.
- 9) Customized stroke length available for S=50-1500 mm.

Ordering key CAT Modular Range



Motor assembly

Right R
Left L

Tube/Screw

Aluminium tube/Sliding screw 33
Aluminium tube/Sliding screw 33H
Steel tube/Ball screw 32B

Stroke length in mm for actuator type

32B	50
33/33H/32B	100
33/33H/32B	200
33/33H/32B	300
33/33H/32B	400
32B	500
32B	700
Special ⁴⁾	xxx

Gear

Ratio 25:1	1
Ratio 12.5:1, N.B! Not self-locking in 33H and 32B without brake	2
Ratio 6.25:1, N.B! Not self-locking in 33H and 32B without brake	4

Rear attachment

Fork ear, Ø=12.0 mm	A1
Fork ear, Ø=12.7 mm	A2
Single ear, Ø=12.0 mm	K1
Single ear, Ø=12.7 mm	K2

Front attachment

Hole, Ø=12.0 mm	G1
Hole, Ø=12.7 mm	G2
Male thread, M12x1.75	G3
Female thread, M12x1.75	G4
Fork ear, Ø=10.1 mm	G5

Options

Friction clutch	F
No friction clutch ⁶⁾	Z
Back up device in ball nut (ball screw)	S

Motor

Without motor	0000
12Vd.c., IP44 (option IP65)	C12C
24Vd.c., IP44 (option IP65)	C24C
24Vd.c. low speed, IP44 (option IP65)	C24CW
12Vd.c. flat motor, IP44	D12C
24Vd.c. flat motor, IP44	D24C
24Vd.c. flat motor with brake, IP20	D24CB
24Vd.c. flat motor with extended shaft, IP44	D24CS
24Vd.c flat motor with low speed, IP44	D24CW
110Va.c., IP54	E110C
110Va.c. with brake, IP20	E110CB
220Va.c., IP54	E220C
220Va.c. with brake, IP20	E220CB
380Va.c. delta connected, IP54	E380C

Options for CxxC motors

Without cable	U
EMC filter ⁶⁾	M
Encoder ²⁾	E
Motor without cover	N
IP 65 ⁷⁾	I
Cable 2 m	T2
Cable with plug 2 m	T2P

2) 4) 6) 7) See page No. 6.

Every care has been taken to ensure the accuracy of the information contained in this publication but no liability can be accepted for any loss or damage whether direct, indirect or consequential arising out of use of the information contained herein. It is the responsibility of the product user to determine the suitability of all products selected for a specific application. Consult SKF for application support.

Performance

Performance CAT 33 with DC-motors

Actuator	Dyn. Load (N)	Speed (mm/s)	Current cons. (A)
CAT(R/L) 33...x1/C12C	3000	13-10	18
CAT(R/L) 33...x2/C12C	2000	24-20	18
CAT(R/L) 33...x4/C12C	1000	48-38	18
CAT(R/L) 33...x1/D12C	2400	11-7	16
CAT(R/L) 33...x2/D12C	1600	21-15	16
CAT(R/L) 33...x4/D12C	800	39-21	16
CAT(R/L) 33...x1/C24C, D24C	3000	13-10	9
CAT(R/L) 33...x2/C24C, D24C	2000	26-20	9
CAT(R/L) 33...x4/C24C, D24C	1000	48-35	9
CAT(R/L) 33...x1/C24CW, D24CW	3000	7-5	5
CAT(R/L) 33...x2/C24CW, D24CW	2000	13-8	5
CAT(R/L) 33...x4/C24CW, D24CW	1000	26-19	5
Performance CAT 33 with AC-motors			
CAT(R/L) 33...x1/E220C 50Hz (6μF), E380C 50Hz	3000	5	
CAT(R/L) 33...x2/E220C 50Hz (6μF), E380C 50Hz	2000	10	
CAT(R/L) 33...x4/E220C 50Hz (6μF), E380C 50Hz	1000	20	
CAT(R/L) 33...x1/E110C 60Hz (25μF)	2400	6	
CAT(R/L) 33...x2/E110C 60Hz (25μF)	1600	12	
CAT(R/L) 33...x4/E110C 60Hz (25μF)	800	24	

Max. Static load for actuator CAT 33: 4000 N.

Performance CAT 33H with DC-motors

Actuator	Dyn. Load (N)	Speed (mm/s)	Current cons. (A)
CAT(R/L) 33H...x1/C12C, D12C	1000	50-38	18
CAT(R/L) 33H...x2/C12C, D12C	600	100-80	18
CAT(R/L) 33H...x4/C12C, D12C	400	174-150	18
CAT(R/L) 33H...x1/C24C, D24C	1200	56-36	9
CAT(R/L) 33H...x2/C24C, D24C	900	113-79	9
CAT(R/L) 33H...x4/C24C, D24C	500	174-140	9
CAT(R/L) 33H...x1/C24CW, D24CW	1200	27-17	5
CAT(R/L) 33H...x2/C24CW, D24CW	800	60-35	5
CAT(R/L) 33H...x4/C24CW, D24CW	500	100-69	5
Performance CAT 33H with AC-motors			
CAT(R/L) 33H...x1/E220C (6μF)	1200	25-20	
CAT(R/L) 33H...x2/E220C (6μF)	900	50-37	
CAT(R/L) 33H...x4/E220C (6μF)	600	100-90	

Max. Static load for actuator CAT 33H: 3000 N.

Performance CAT 32B with DC-motors

Actuator	Dyn. Load (N)	Speed (mm/s)	Current cons. (A)
CAT(R/L) 32B...x1/C12C	4000	17-12	18
CAT(R/L) 32B...x2/C12C	2500	32-25	18
CAT(R/L) 32B...x4/C12C	1500	63-48	18
CAT(R/L) 32B...x1/D12C	3000	17-11	16
CAT(R/L) 32B...x2/D12C	2000	34-19	16
CAT(R/L) 32B...x4/D12C	1000	67-43	16
CAT(R/L) 32B...x1/C24C, D24C	4000	17-13	9
CAT(R/L) 32B...x2/C24C, D24C	2500	33-24	9
CAT(R/L) 32B...x4/C24C, D24C	1500	65-50	9
CAT(R/L) 32B...x1/C24CW, D24CW	4000	9-5	5
CAT(R/L) 32B...x2/C24CW, D24CW	2500	18-10	5
CAT(R/L) 32B...x4/C24CW, D24CW	1500	34-24	5
Performance CAT 32B with AC-motors			
CAT(R/L) 32B...x1/E220C 50Hz (6μF), E380C 50Hz	3500	6.5	
CAT(R/L) 32B...x2/E220C 50Hz (6μF), E380C 50Hz	2100	13	
CAT(R/L) 32B...x4/E220C 50Hz (6μF), E380C 50Hz	1300	26	
CAT(R/L) 32B...x1/E110C 60Hz (25μF)	3500	8	
CAT(R/L) 32B...x2/E110C 60Hz (25μF)	2100	16	
CAT(R/L) 32B...x4/E110C 60Hz (25μF)	1300	32	

Max. Static load for actuator CAT 32B: 5400 N.

SKF Actuation Systems - Product groups



Systems



Linear actuators



Telescopic pillars



Rotary actuators

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