EWELLIX

MAKERS IN MOTION

Linear actuator CAHB series

CAHB series

Designed to operate in harsh environment with temperatures from –40 to 85 °C up to 25% duty cycle, Ewellix electromechanical actuator CAHB family features robust metal gears and corrosion-resistant housings.

Available in 7 series - CAHB-20A/20E/21E/22E for medium and heavy load applications with an over load protection by clutch, CAHB-10, a compact solution for low-load applications and CAHB-30A/31N for AC version- Ewellix electromechanical actuators, are virtually maintenance-free, self-locking up to 2 times the rated load and rated up to IP69K/66M. Additional design options are available like limit switches, positioning feedback and manual over ride.

Features

- Long stroke and high speed
- High holding force up to 20 000 N
- Absolute or incremental Position feedback and limit switches option
- Low basklash
- Manual override option
- Overload and thermal protection
- Ingress protection IP69K/66M with vent
- Stainless steel push tube and Corrosion protected metal parts
- Wide temperature range (–40 to 85 °C)
- Mechanical, electrical and climatic tests
- High efficiency
- Virtually maintenance-free

See ↳ **pages 38** and **39** for test results.

Benefits

- High productivity and usability of the adjustment
- Reliability and safety
- Save development time and shorten the time to market
- Cost effectiveness
- Durable

CAHB-10

Linear actuator

Benefits

- Compact design
- Designed for harsh environment
- Robust and reliable
- Integrated limit switches
- Quiet operation
- Thermal protection
- Optional potentiometer and 2-Hall encoder available
- Electromagnetic compatibility (EMC) compliant

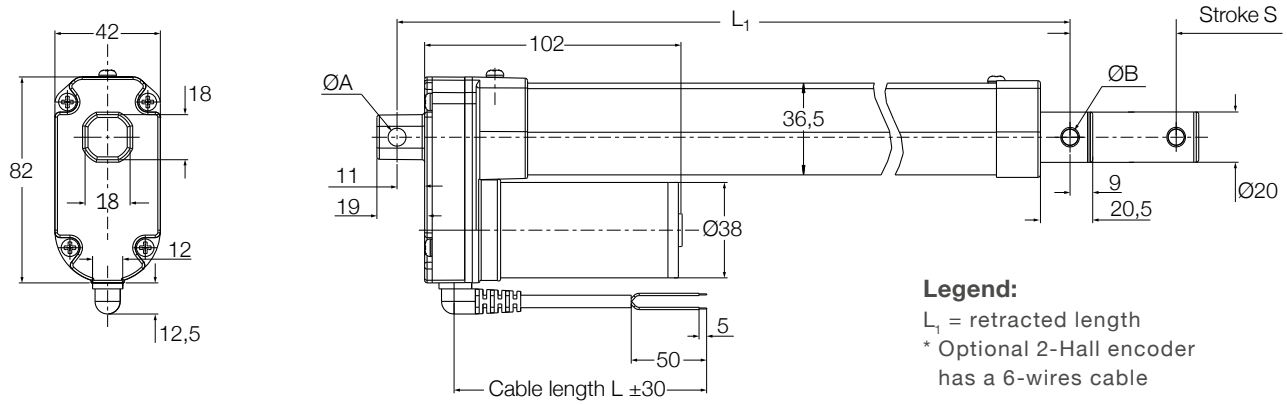
Technical data

Designation	Unit	CAHB–10... 1	CAHB–10... 2	CAHB–10... 3	CAHB–10... 4	CAHB–10... 5	CAHB–10... 6
Push load	N	120	240	500	750	1 000	1 500
Pull load	N	120	240	500	750	1 000	1 500
Speed (full load to no load)	mm/s	45 to 56	24 to 30	13 to 16	8 to 10	6 to 8	5 to 8
Stroke	mm	50 to 300	50 to 300	50 to 300	50 to 300	50 to 300	50 to 300
Retracted length	mm	–[1)]	–[1)]	–[1)]	–[1)]	–[1)]	–[1)]
Voltage	V DC	12 or 24	12 or 24	12 or 24	12 or 24	12 or 24	12 or 24
Power consumption	W	N/A	N/A	N/A	N/A	N/A	N/A
Current consumption 12 V DC	A	4	3,5	3,2	3	2,8	4,4
24V DC	A	2,2	2	1,8	1,8	1,6	2,8
Duty cycle	%	25	25	25	25	25	20
Ambient temperature	°C	–40 to +85	–40 to +85	–40 to +85	–40 to +85	–40 to +85	–40 to +85
Type of protection	IP	66s/69k	66s/69k	66s/69k	66s/69k	66s/69k	66s/69k
Weight (at 300 mm stroke)	kg	1,5	1,5	1,5	1,5	1,5	1,5
Color	–	Silver	Silver	Silver	Silver	Silver	Silver
Limit switches	–	Yes	Yes	Yes	Yes	Yes	Yes
Thermal protection	–	Yes	Yes	Yes	Yes	Yes	Yes

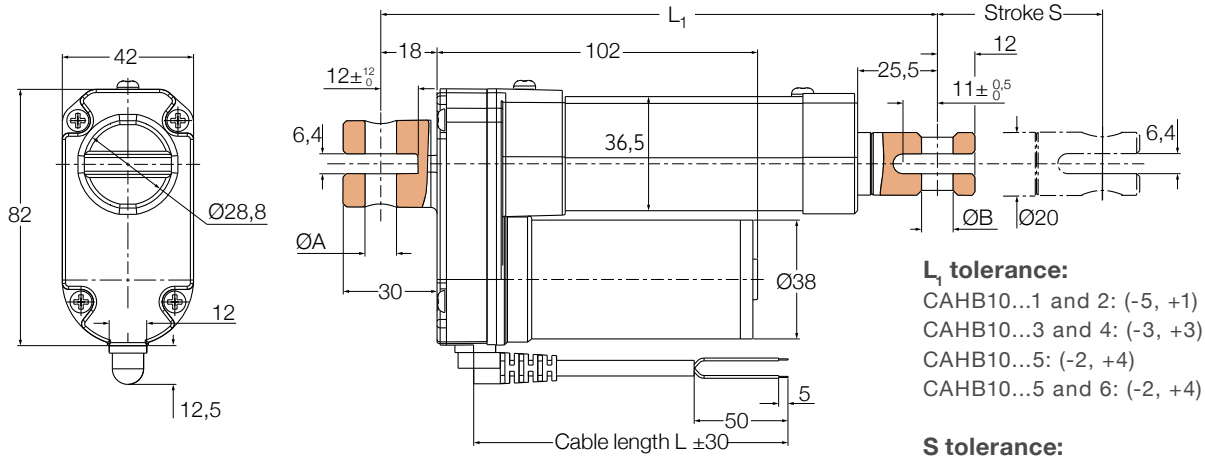
[1)] For basic configuration see dimensional drawing ↳ **page 5**
For potentiometer configuration see dimensional drawing ↳ **page 7**

Dimensional drawing

Basic configuration and optional 2-Hall encoder



Legend:
L_1 = retracted length
* Optional 2-Hall encoder has a 6-wires cable



L_1 tolerance:
CAHB10...1 and 2: (-5, +1)
CAHB10...3 and 4: (-3, +3)
CAHB10...5: (-2, +4)
CAHB10...5 and 6: (-2, +4)

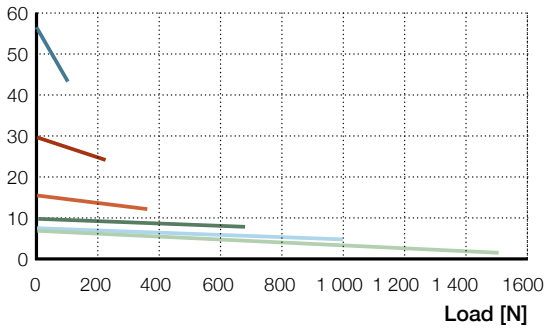
S tolerance:
CAHB10...1 and 2: (-1, +5)
CAHB10...3 and 4: (-3, +3)
CAHB10...5: (-4, +2)
CAHB10...5 and 6: (-2, +4)

Stroke [mm]	50	100	150	200	250	300
Retracted length (L_1)	158	209	260	311	362	413
Retracted length with fork head	179	230	281	332	383	434

Performance diagrams

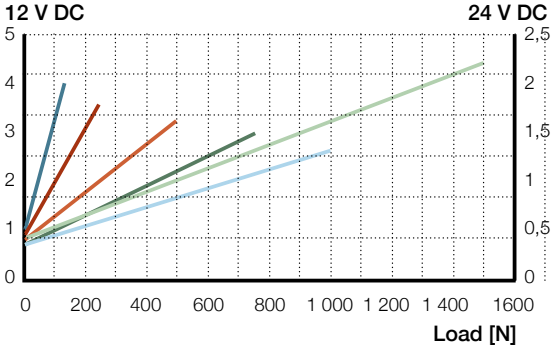
Speed-load diagram

Speed [mm/s]



Current-load diagram

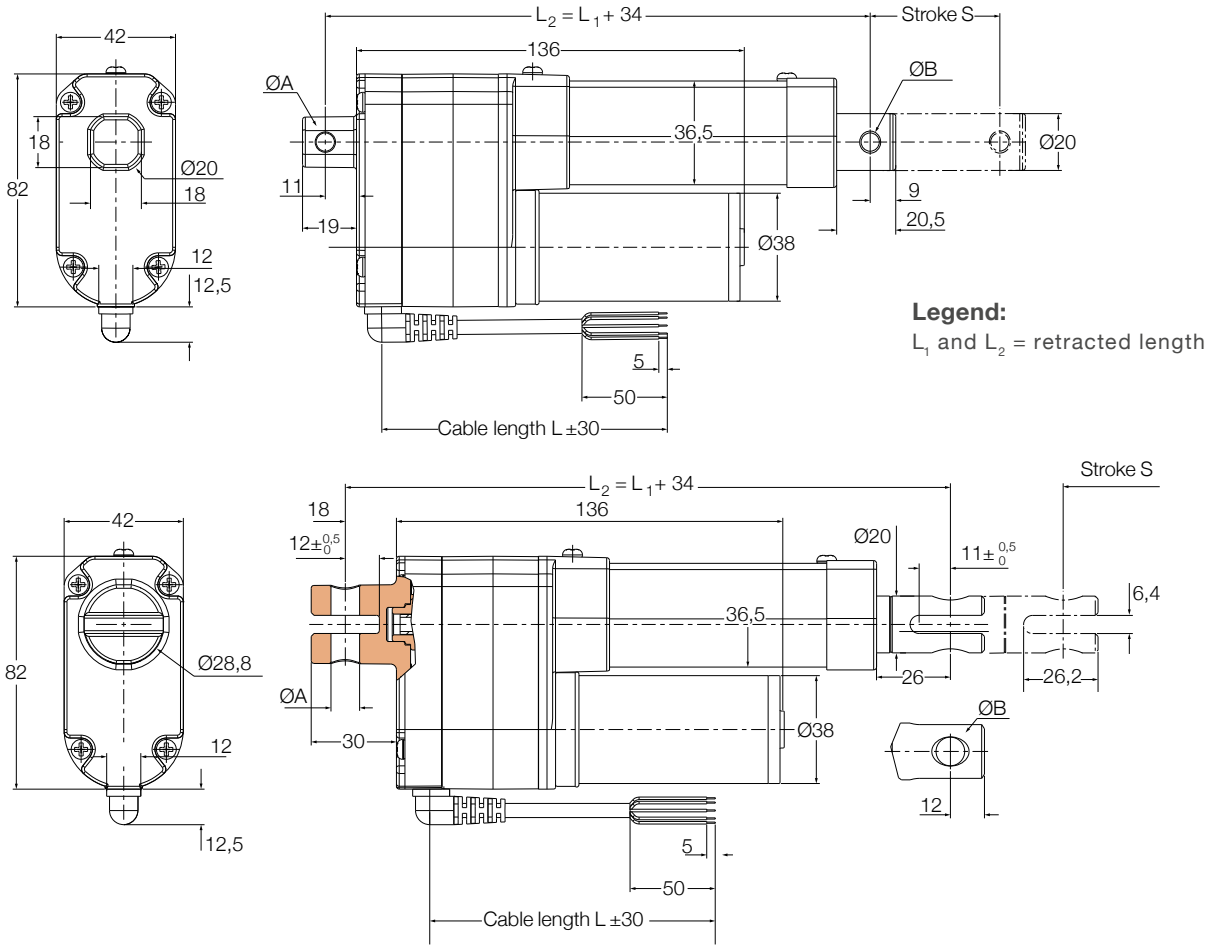
Current consumption [A]



CAHB-10...1
CAHB-10...2
CAHB-10...3
CAHB-10...4
CAHB-10...5
CAHB-10...6

Dimensional drawing

Optional potentiometer

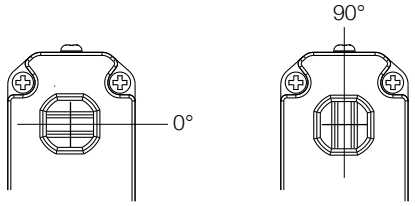


L_2 tolerance:
CAHB10...1 and 2: (-5, +1)
CAHB10...3 and 4: (-3, +3)
CAHB10...5: (-2, +4)
CAHB10...5 and 6: (-2, +4)

S tolerance:
CAHB10...1 and 2: (-1, +5)
CAHB10...3 and 4: (-3, +3)
CAHB10...5: (-4, +2)
CAHB10...5 and 6: (-2, +4)

Stroke (mm)	50	100	150	200	250	300
Retracted length (L_2)	192	243	294	345	396	447
Retracted length with fork head	213	264	315	366	417	468

Attachment



Encoder resolution

Type	CAHB-10...1	CAHB-10...2	CAHB-10...3	v CAHB-10...4	CAHB-10...5/6
Mm/pulse	0,3	0,15	0,075	0,05	0,038

Potentiometer resolution

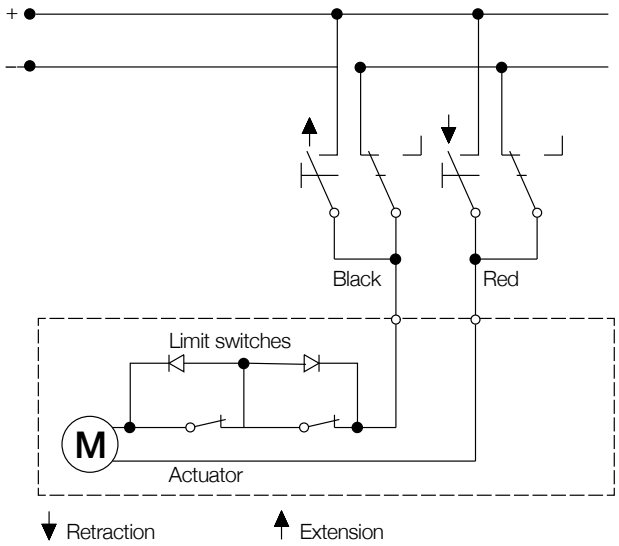
Stroke [mm]	50~80	80~160	160~300
Minimum resistence value of potentiometer	700~1 300 Ω	700~1 300 Ω	700~1 300 Ω
Potentiometer resolution	100 Ω/mm	50 Ω/mm	16,6 Ω/mm

Absolute analog output

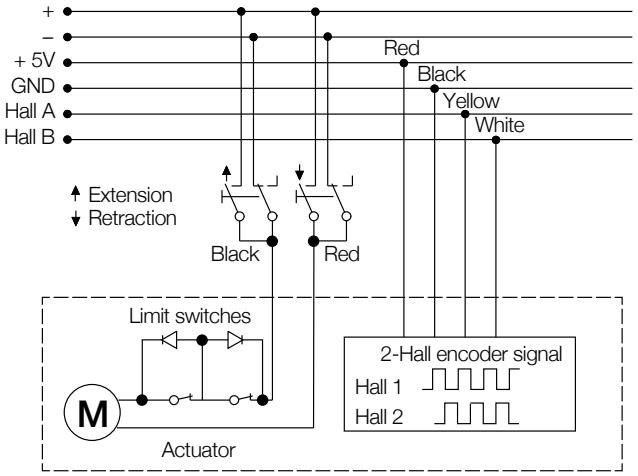
Stroke [mm]	50~80	80~160	160~300
Initial value VS RL position (V)	0,5	0,5	0,5
Resolution (mm)	0,024	0,049	0,0146
Position feedback change (V/mm)	0,05	0,025	0,0083

Connecting diagram

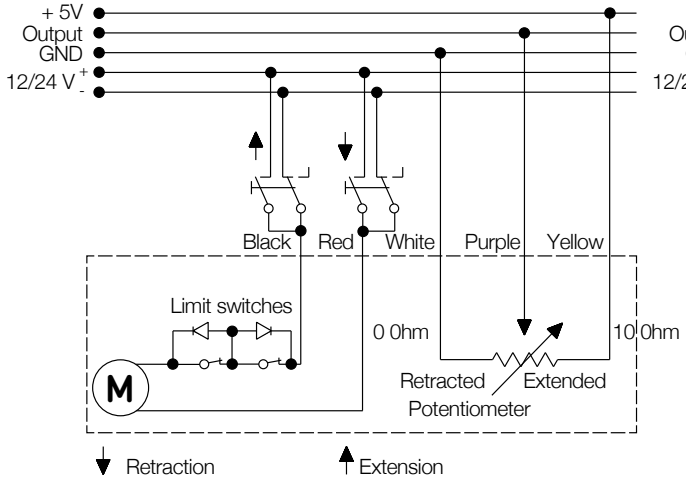
Basic configuration
12/24 V DC



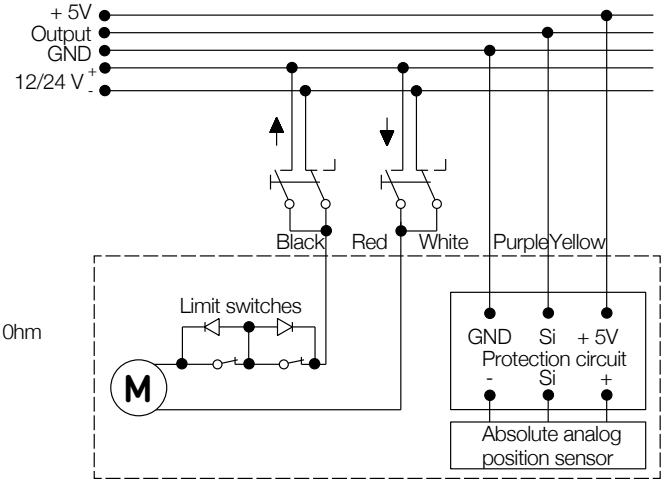
2-Hall encoder
12/24 V DC



Potentiometer



Absolute analog output



Ordering key

Type

Voltage

12 V DC	A
24 V DC	B

Load

120 N	1
240 N	2
500 N	3
750 N	4
1 000 N	5
1 500 N	6

Screw

TR12 screw	A
Customized	X

Stroke

50 mm	050
100 mm	100
150 mm	150
200 mm	200
250 mm	250
300 mm	300

Retracted length[1)]

Stroke without potentiometer:[2)]	A(B)+A(B)	A(B)+C	C+A(B)	C+C
50 mm	158	165	172	179
100 mm	209	216	223	230
150 mm	260	267	274	281
200 mm	311	318	325	332
250 mm	362	369	376	383
300 mm	413	420	427	434

IP

Standard (IP 66s/69k)	A

Front attachment

Rod with hole Ø 6,4 mm	A
Rod with hole Ø 8 mm	B
Fork head with hole Ø 10,1 mm	C
Customized	X

Rear attachment

Rod with hole Ø 6,4 mm	A
Rod with hole Ø 8 mm	B
Fork head with hole Ø 10,1 mm	C
Customized	X

Hole direction of the attachments

0°	A
90°	B

Option 1: Position Poutput

None	O
Absolute analog position	A
Potentiometer	P
2-Hall encoder	H

Cable lenght

600 mm without connector	A
1 000 mm without connector	B
1 500 mm without connector	C
2 000 mm without connector	D
2 500 mm without connector	E
3 000 mm without connector	F
Customized	X

[1)] Retracted lenght will be englared 34 mm with Potentiometer option
[2)] Front attachment + Rear attachment; A, B, C mean the attachment types

CAHB-20A

Linear actuator

Benefits

- ACME screw drive
- Extension tube (stainless steel)
- Protection tube (steel)
- Enhanced corrosion resistance
- Mechanical overload protection (clutch)
- Lubricated for service life
- Robust, designed for tough environment
- Self-locking
- Certified (CE: EN 55011)

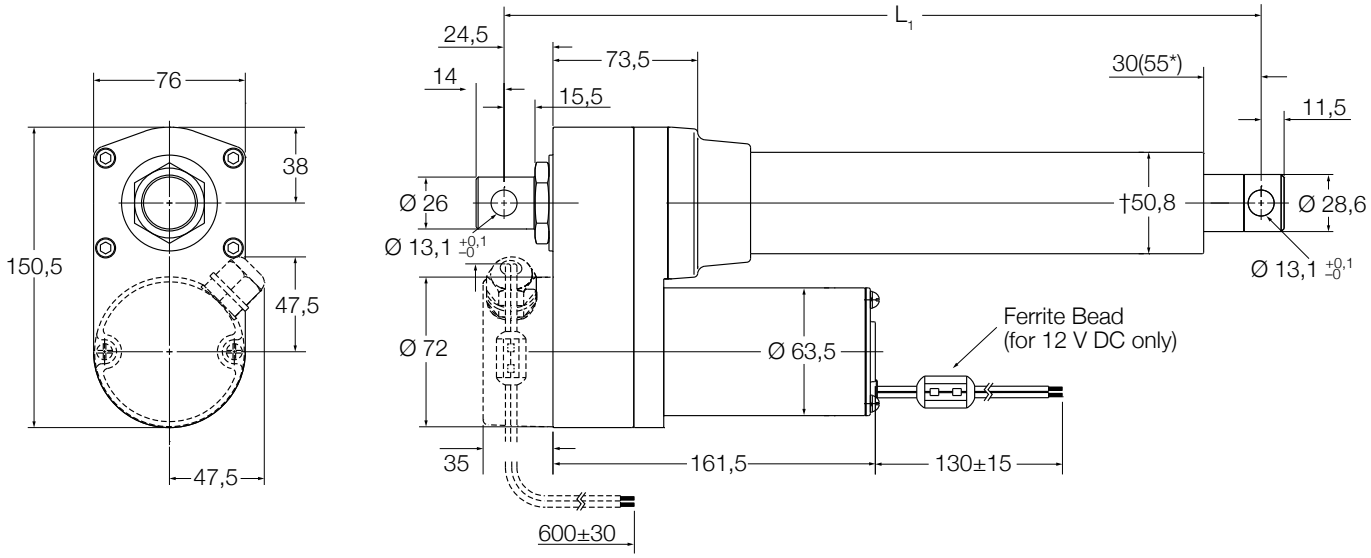
Technical data

Designation	Unit	CAHB-20... 1	CAHB-20... 2
Performance data			
Push load	N	1 500	2 500
Pull load	N	1 500	2 500
Speed (full load to no load)	mm/s	27 to 33	13 to 17
Stroke	mm	102 to 610	102 to 610
Retracted length mm –* –*	mm	–*	–*
Voltage	V DC	12 or 24	12 or 24
Power consumption	W	N/A	N/A
Current consumption 12 V DC	A	16	14
24 V DC	A	8	7
Duty cycle	%	25	25
Ambient temperature	°C	–40 to +85	–40 to +85
Type of protection	IP	66	66
Weight (at 305 mm stroke)	kg	5,5	5,5
Color	–	Black	Black

* see dimensional drawing ↳ **page 11** and **12**

Dimensional drawing

Basic configuration (dashed line for optional limit switch)



Without limit swicth:
RED (+) & BLACK (–) = retraction
RED (–) & BLACK (+) = extension

With limit switch:
RED (+) & BLACK (–) = extension
RED (–) & BLACK (+) = retraction

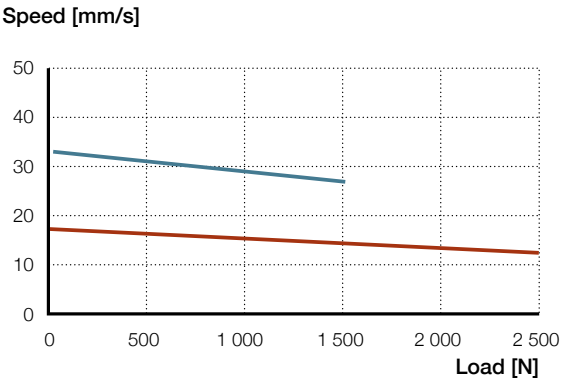
Legend:
L_1 = retracted length
*55 = dimension with limit switch

	With limit switch[1]						Without limit switch[2]					
Stroke [mm]	102	153	204	305	457	610	102	153	204	305	457	610
L_1 Retracted length	338	389	440	592	744	897	262	313	364	465	668	821

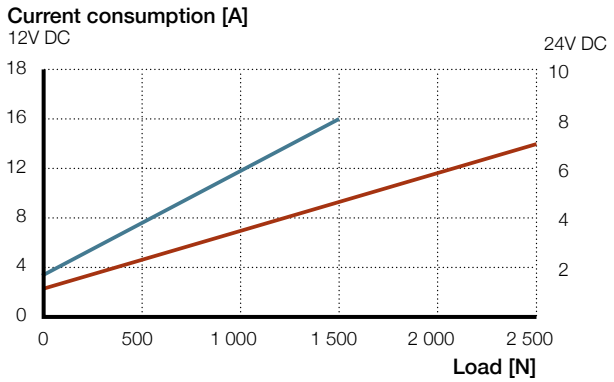
[1] Tolerance: S and L1 = ± 5,0 mm (If S≥305 mm, S = ± 7,5 mm)
[2] Tolerance: S = ± 2,5 mm and L = ±3,8 mm

Performance diagrams

Speed-load diagram



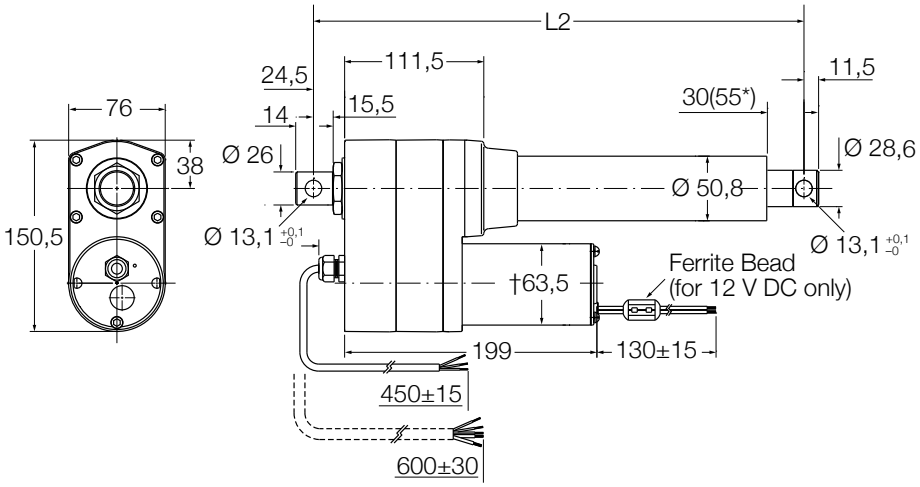
Current-load diagram

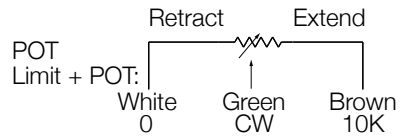


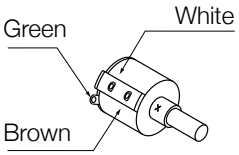
CAHB-20...1
CAHB-20...2

Dimensional drawing

Optional potentiometer (dashed line for optional limit switch)







Without limit swicth:
RED (+) & BLACK (–) = retraction
RED (–) & BLACK (+) = extension

With limit switch:
RED (+) & BLACK (–) = extension
RED (–) & BLACK (+) = retraction

Legend:
L2 = retracted length
*55 = dimension with limit switch

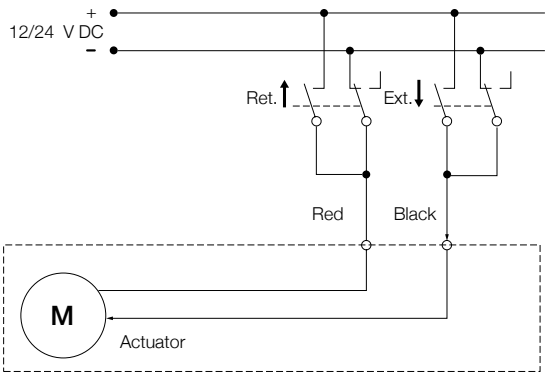
	With limit switch[1]						Without limit switch[2]					
Stroke [mm]	102	153	204	305	457	610	102	153	204	305	457	610
L_1 Retracted length	376	427	478	630	782	935	300	351	402	503	706	859

[1] Tolerance: S and L1 = ± 5,0 mm (If S≥305 mm, S = ± 7,5 mm)
[2] Tolerance: S = ± 2,5 mm and L2 = ± 3,8 mm

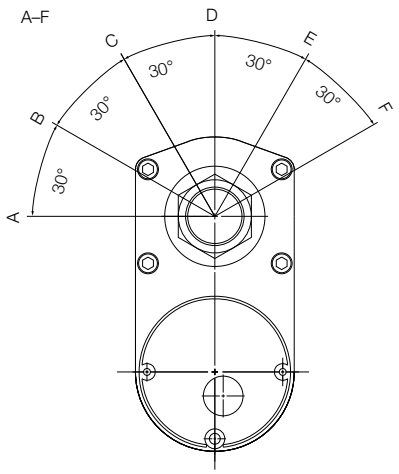
Potentiometer resolution

Stroke [mm]	102	153	204	305	457	610
Ohm/mm	59,0	59,0	29,5	29,5	9,84	9,84

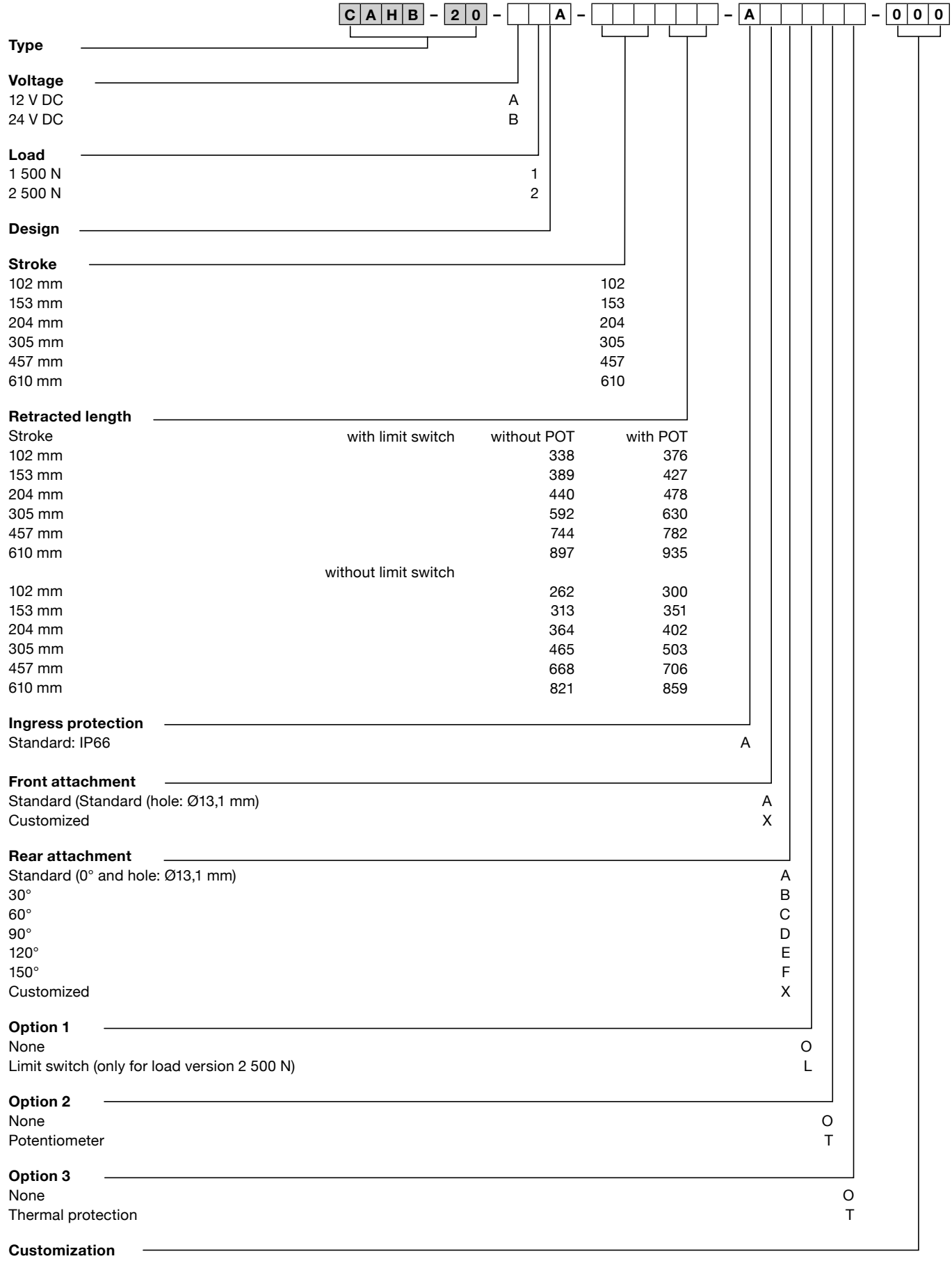
Connecting diagram



Different rear attachment



Ordering key



In standard, the actuators are IP69K / IP66M and equipped with GORE Automotive vent, built-in thermal protection, protection Clutch and EMC filter.

CAHB-20E

Linear actuator

Benefits

- High productivity
- Reliability and safety
- Save development time
- Cost effectiveness

Features

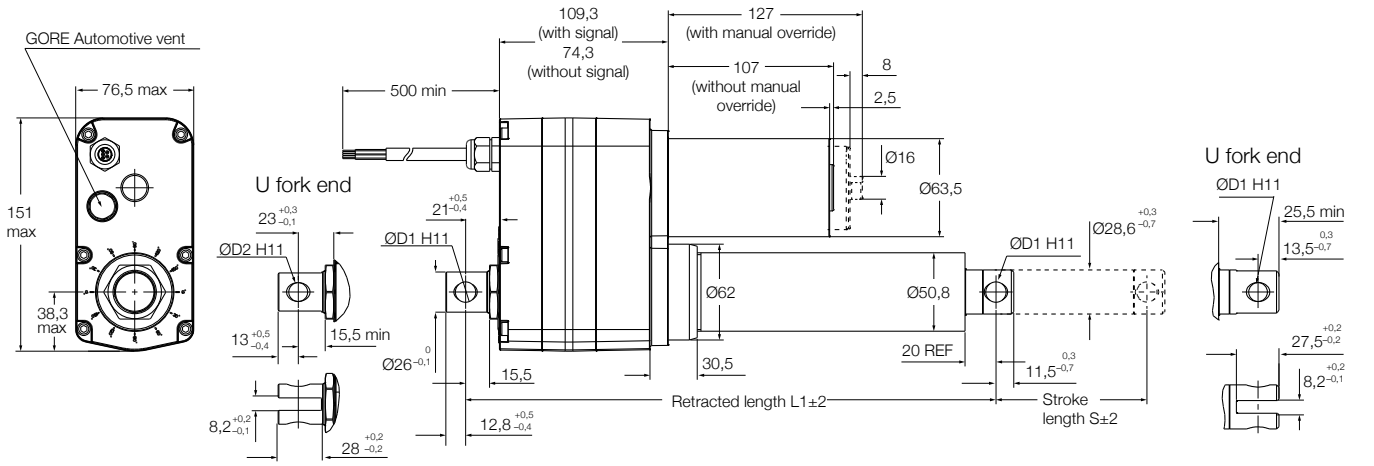
- Holding force
- Mechanical overload protection
- Enhanced ingress protection
- Corrosion protection and stainless steel tube
- Manual override option
- Virtuality maintenance free

Technical data

Designation	Unit	CAHB-20E / 12 V			CAHB-20E / 24 V		
Performance data							
Rated Push Force	N	1 500	2 500	4 500	1 500	2 500	4 500
Rated Pull Force	N	1 500	2 500	4 500	1 500	2 500	4 500
Max pull / push Force[1)]	N	2 600	3 800	6 300	2 600	3 800	6 300
Holding force[2)]	N						
Speed without load	mm/s	27,0	23,5	13,5	29,0	22,0	13,0
Speed with the rated force	mm/s	24,5	17,5	10,5	25,5	19,0	11,0
Electric data							
Nominal voltage	V DC	12	12	12	24	24	24
Nominal current @ rated load	A	12,5	15	17	5	6,5	8
Rated current (clutch activation)	A	18,4	21	22,4	6,8	8,8	10,4
Duty cycle	%	10% (85/765 s)	10% (85/765 s)	10% (85/765 s)	20% (85/340 s)	20% (85/340 s)	20% (85/340 s)
Mechanical data							
Stroke	mm	50 … 700	50 … 700	50 … 700	50 … 700	50 … 700	50 … 700
Backlash	mm	0,6	0,6	0,6	0,6	0,6	0,6
Weight for 200 mm stroke	kg	4,5	4,5	4,5	4,5	4,5	4,5
Colour	–	Black	Black	Black	Black	Black	Black
Environment and standards							
Ambient temperature	°C	–40 … 85	–40 … 85	–40 … 85	–40 … 85	–40 … 85	–40 … 85
Degree of protection	–	IP 69K/66M					
Standards / EMC	–	EN61000-6-2:2005, EN61000-6-4:2007/A1:2011					
Salt spray test	–	ISO 9227:2012, 250 hours					

[1)] Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits
[2)] Ultimate Static Load, refer to the “Static load” diagrams

Dimensional drawing



	Rod end attachment (D1)					U fork attachment (D2)	
Holes symbol	A	B	C	D	E	F	G
Hole dimension	13,1	12,8	12,5	14	12,2	12,2	12,8

	Rod end attachment		U fork attachment	
S Stroke [mm]	50-305	306-700	50-305	306-700
L_1 retracted length no option	160 + stroke	211 + stroke	172 + stroke	223 + stroke
L_1 retracted length with signal	195 + stroke	246 + stroke	207 + stroke	258 + stroke

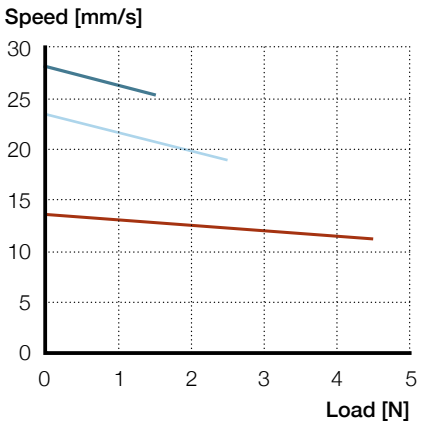
Technical data

Designation	Unit	CAHB-20E / 48 V		
Performance data				
Rated Push Force	N	1 500	2 500	4 500
Rated Pull Force	N	1 500	2 500	4 500
Max pull / push Force[1)]	N	2 600	3 800	6 300
Holding force[2)]	N			
Speed without load	mm/s	31,0	23,0	13,0
Speed with the rated force	mm/s	27,5	20,0	11,0
Electric data				
Nominal voltage	V DC	48	48	48
Nominal current @ rated load	A	2,6	3,8	4,2
Rated current (clutch activation)	A	4,3	5,6	5,8
Duty cycle	%	20% (85/340 s)	20% (85/340 s)	20% (85/340 s)
Mechanical data				
Stroke	mm	50 ... 700	50 ... 700	50 ... 700
Backlash	mm	0,6	0,6	0,6
Weight for 200 mm stroke	kg	4,5	4,5	4,5
Colour	–	Black	Black	Black
Environment and standards				
Ambient temperature	°C	–40 … 85	–40 … 85	–40 … 85
Degree of protection	–	IP 69K/66M		
Standards / EMC	–	EN61000-6-2:2005, EN61000-6-4:2007/A1:2001		
Salt spray test	–	ISO 9227:2012, 250 hours		

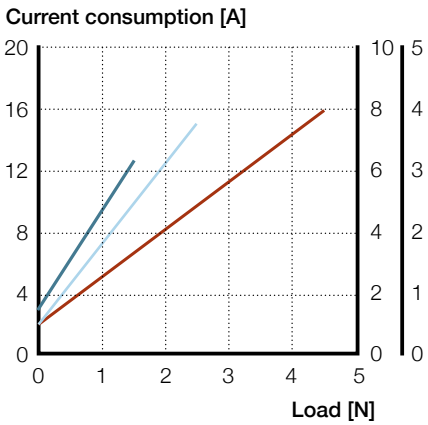
[1)] Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits
[2)] Ultimate Static Load, refer to the “Static load” diagrams

Performance diagrams

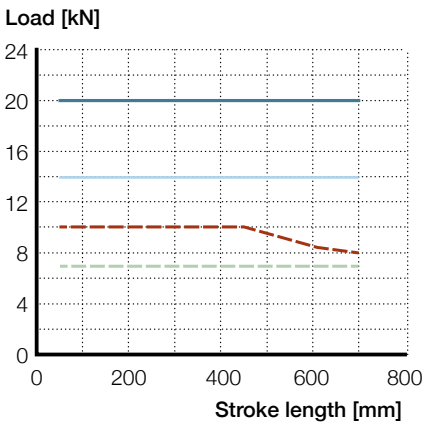
Speed-load diagram



Current load diagram



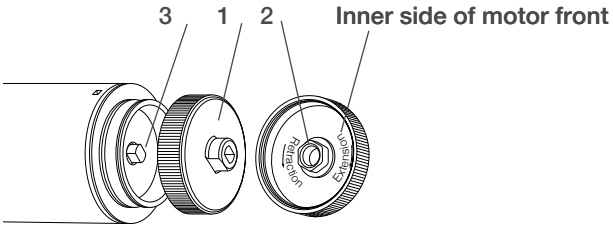
Static load diagram



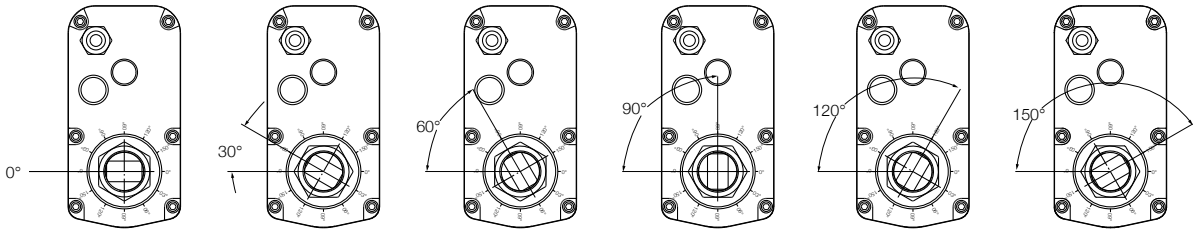
Rated push force 1 500
Rated push force 2 500
Rated push force 4 500
Ultimate CAHB-20-xxE (push)
Ultimate CAHB-20-xxE (pull)
Recommended CAHB 20-xxE (push)
Recommended CAHB 20-xxE (pull)

Manual override

Release the motor cover (1). Use the slot (2) to rotate the motor shaft (3) in the proper direction



Attachment



Electrical specifications

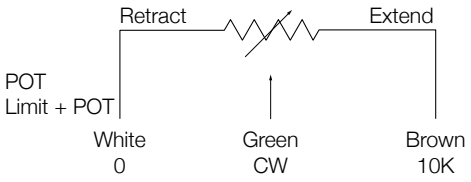
Wire connection with no signal

Wire no.	AWG	Colour	Application
1	14	Red	Motor power(+)=> Extension, (–)=> Retraction
2	14	Black	Motor power(–)=> Extension, (+)=> Retraction

Wire connection with potentiometer

Wire no.	AWG	Colour	Application
1	22	Green	See picture description
2	22	White	See picture description
3	22	Brown	See picture description
4	14	Red	Motor power(+)=> Extension, (–)=> Retraction
5	14	Black	Motor power(–)=> Extension, (+)=> Retraction

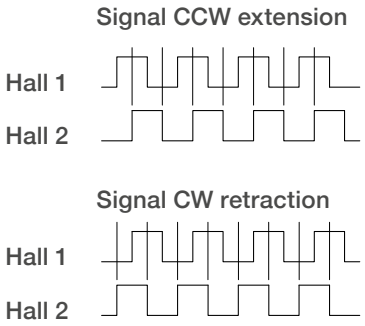
Potentiometer



Wire connection with encoder

Wire no.	AWG	Colour	Application	
1	26	Green	Sensor signal 1	Encoder
2	26	Yellow	Sensor signal 2	Encoder
3	26	Black	Sensor power GND	Encoder
4	26	Red	Sensor power 5 V	Encoder
5	14	Red	Motor power(+)=> Extension, (–)=> Retraction	
6	14	Black	Motor power(–)=> Extension, (+)=> Retraction	

Encoder

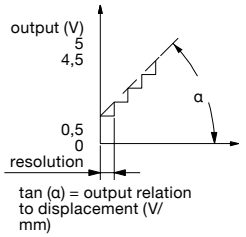


Wire connection with absolute analog output

Wire no.	AWG	Colour	Application
1	22	Green	Output signal
2	22	White	Sensor power GND
3	22	Brown	Sensor power +10~55 VDC
4	14	Red	Motor power(+)=> Extension, (–)=> Retraction
5	14	Black	Motor power(–)=> Extension, (+)=> Retraction

Absolut analog position output

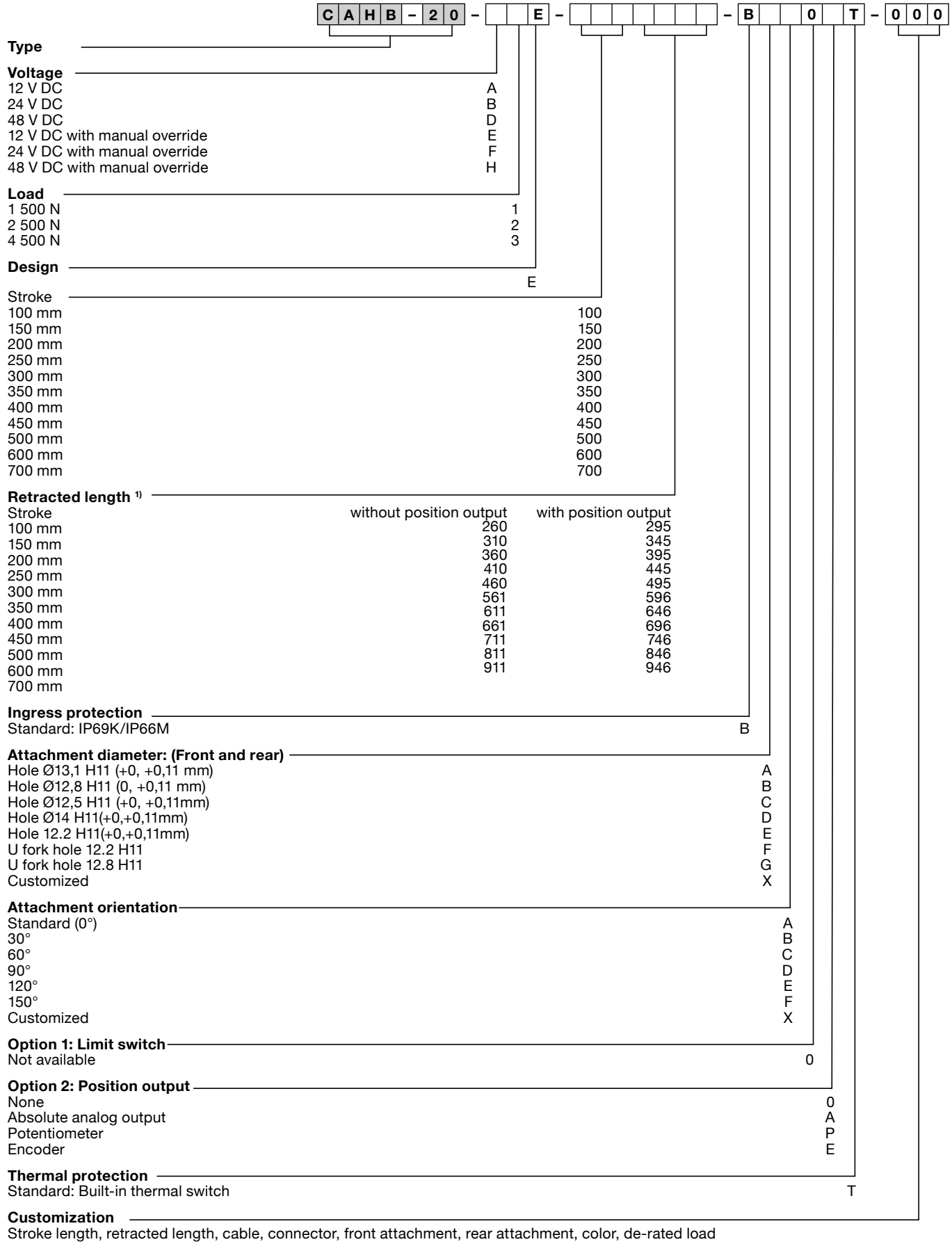
Input voltage:	10~55 V DC
Current consumpion:	15 mA max.
Output analog signal (voltage):	0~5 V DC
Max current output:	5 mA
Absolute analog output set up:	
retraction 0,5±0,15 V	
extension 4,5 to the maximum	



Output relation to displacement and resolution

Actuator type	Hall sensor [pulses/mm]	Potentiometer [ohm/mm]	Absolute analogue position output [V/mm]	Resolution of the absolute analog position output [mm]
CAHB-20...E	2,76	59,06 if S=050-125	0,0295 if S=050-125	0,0413 if S=050-125
		29,53 if S=126-250	0,0295 if S=126-250	0,0827 if S=126-250
		9,84 if S=251-700	0,0295 if S=251-700	0,2480 if S=251-700

Ordering key



1) Retracted length +12mm when attachments U fork are used.
In standard, the actuators are IP69K / IP66M and equipped with GORE Automotive vent, built-in thermal protection, protection Clutch and EMC filter.

CAHB-21E

Linear actuator

Benefits

- High productivity
- Reliability and safety
- Save development time
- Cost effectiveness

Features:

- High holding force
- High speed
- Mechanical overload protection
- Enhanced ingress protection
- Corrosion protection and stainless steel tube
- Manual override option
- Virtuality maintenance free

Technical data

Designation	Unit	CAHB-21E / 12 V			CAHB-21E / 24 V		
Performance data							
Rated Push Force	N	1 500	2 500	4 500	1 500	2 500	4 500
Rated Pull Force	N	1 500	2 500	4 500	1 500	2 500	4 500
Max pull / push Force[1)]	N	2 500	3 600	6 300	2 500	3 600	6 300
Holding force[2)]	N						
Speed without load	mm/s	49,5	37	24,0	52,5	38	22,5
Speed with the rated force	mm/s	43	31,5	19,0	50	31,5	21,0
Electric data							
Nominal voltage	V DC	12	12	12	24	24	24
Nominal current @ rated load	A	14,5	16	19	7	7,5	10,5
Rated current (clutch activation)	A	19,2	20,2	24,8	9,1	9,3	13,7
Duty cycle	%	10% (85/765 s)	10% (85/765 s)	10% (85/765 s)	20% (85/340 s)	20% (85/340 s)	20% (85/340 s)
Mechanical data							
Stroke	mm	50 … 700	50 … 700	50 … 700	50 … 700	50 … 700	50 … 700
Backlash	mm	0,6	0,6	0,6	0,6	0,6	0,6
Weight for 200 mm stroke	kg	4,8	4,8	4,8	4,8	4,8	4,8
Colour	–	Black	Black	Black	Black	Black	Black
Environment and standards							
Ambient temperature	°C	–40 … 85	–40 … 85	–40 … 85	–40 … 85	–40 … 85	–40 … 85
Degree of protection	–	IP 69K/66M					
Standards / EMC	–	EN61000-6-2:2005, EN61000-6-4:2007/A1:2011					
Salt spray test	–	ISO 9227:2012, 250 hours					

[1)] Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits
[2)] Ultimate Static Load, refer to the “Static load” diagrams

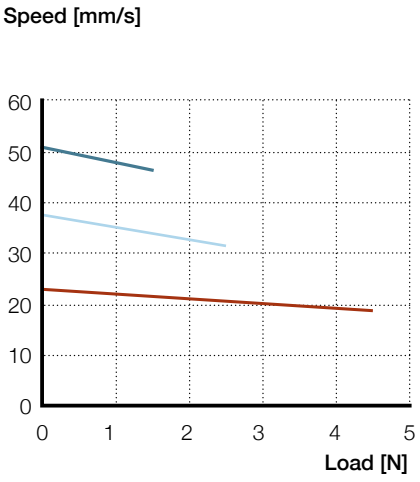
Technical data

Designation	Unit	CAHB-21E / 48 V		
Performance data				
Rated Push Force	N	1 500	2 500	4 500
Rated Pull Force	N	1 500	2 500	4 500
Max pull / push Force[1)]	N	2 500	3 600	6 300
Holding force[2)]	N			
Speed without load	mm/s	51,5	41,0	23,5
Speed with the rated force	mm/s	46,0	33,5	19,0
Electric data				
Nominal voltage	V DC	48	48	48
Nominal current @ rated load	A	4,0	4,5	5,0
Rated current (clutch activation)	A	5,6	6,1	6,4
Duty cycle	%	20% (85/340 s)	20% (85/340 s)	20% (85/340 s)
Mechanical data				
Stroke	mm	50 ... 700	50 ... 700	50 ... 700
Backlash	mm	0,6	0,6	0,6
Weight for 200 mm stroke	kg	4,8	4,8	4,8
Colour	–	Black	Black	Black
Environment and standards				
Ambient temperature	°C	–40 … 85	–40 … 85	–40 … 85
Degree of protection	–	IP 69K/66M		
Standards / EMC	–	EN61000-6-2:2005, EN61000-6-4:2007/A1:2011		
Salt spray test	–	ISO 9227:2012, 250 hours		

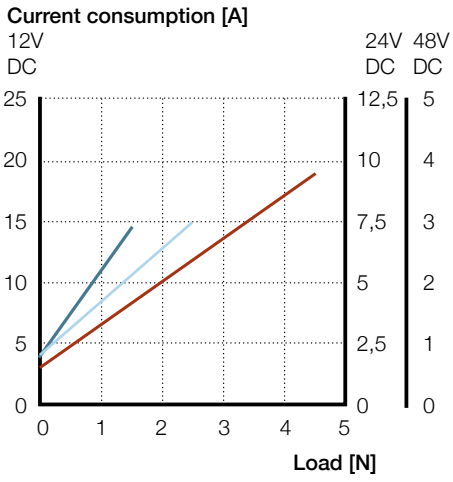
[1)] Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits
[2)] Ultimate Static Load, refer to the “Static load” diagrams

Performance diagrams

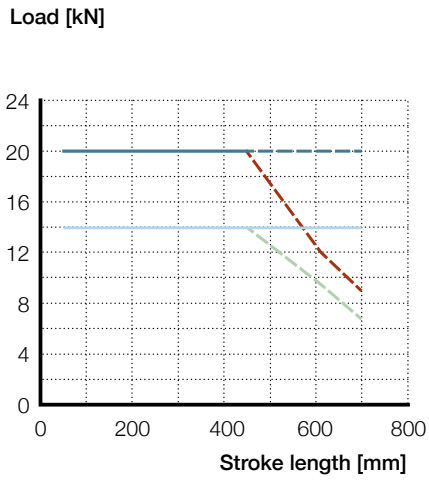
Speed-load diagram



Current load diagram

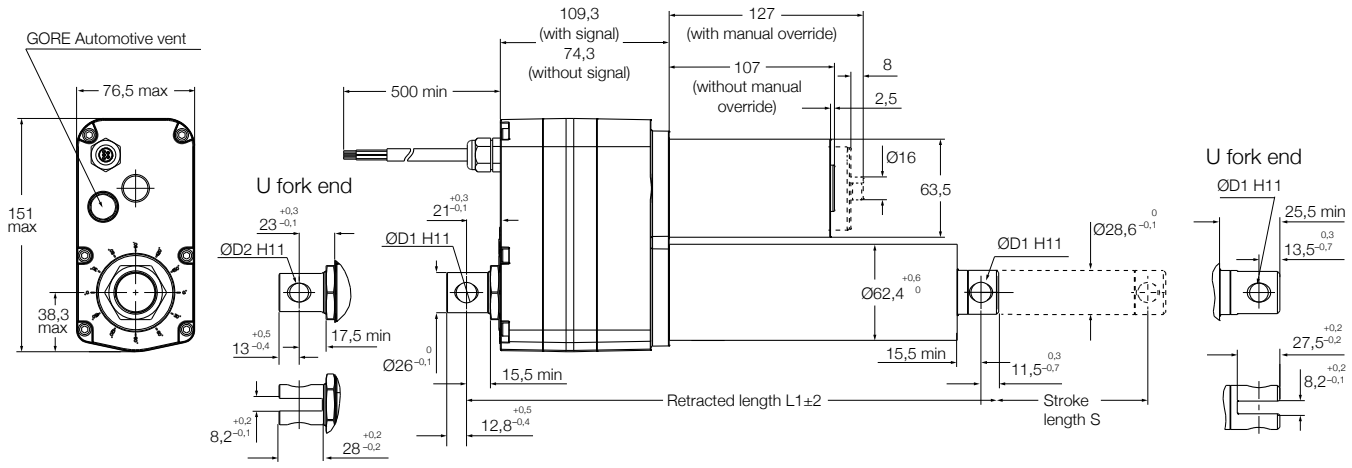


Static load diagram



Rated push force 1 500
Rated push force 2 500
Rated push force 4 500
Ultimate CAHB-21-xxE (push)
Ultimate CAHB-21-xxE (pull)
Recommended CAHB 21-xxE (push)
Recommended CAHB 21-xxE (pull)

Dimensional drawing

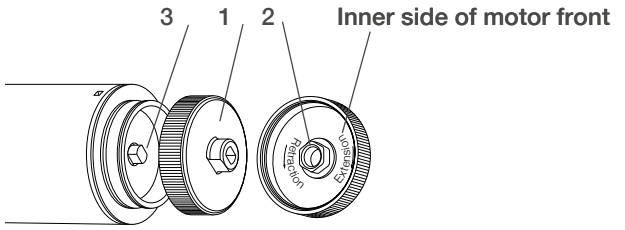


	Rod end attachment (D1)					U fork attachment (D2)	
Holes symbol	A	B	C	D	E	F	G
Hole dimension	13,1	12,8	12,5	14	12,2	12,2	12,8

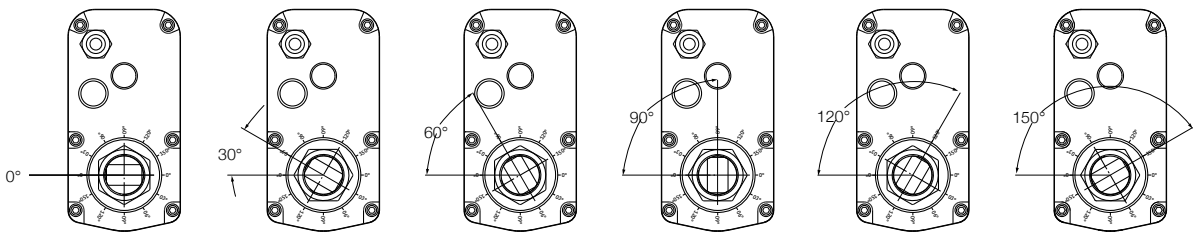
	Rod end attachment		U fork attachment	
S Stroke [mm]	50-305	306-700	50-305	306-700
L_1 retracted length no option	182 + stroke	217 + stroke	194 + stroke	229 + stroke
L_1 retracted length with LS	191 + stroke	226 + stroke	203 + stroke	238 + stroke
L_1 retracted length with signal	217 + stroke	252 + stroke	229 + stroke	264 + stroke
L_1 retracted length sith LS and signal	226 + stroke	261 + stroke	238 + stroke	273 + stroke

Manual override

Release the motor cover (1). Use the slot (2) to rotate the motor shaft (3) in the proper direction



Attachment



Electrical specifications

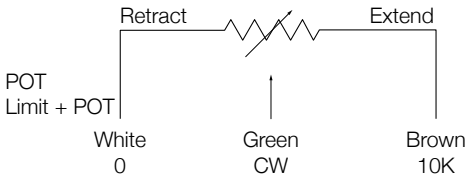
Wire connection with no signal

Wire no.	AWG	Colour	Application
1	14	Red	Motor power(+)=> Extension, (–)=> Retraction
2	14	Black	Motor power(–)=> Extension, (+)=> Retraction

Wire connection with potentiometer

Wire no.	AWG	Colour	Application
1	22	Green	See picture description
2	22	White	See picture description
3	22	Brown	See picture description
4	14	Red	Motor power(+)=> Extension, (–)=> Retraction
5	14	Black	Motor power(–)=> Extension, (+)=> Retraction

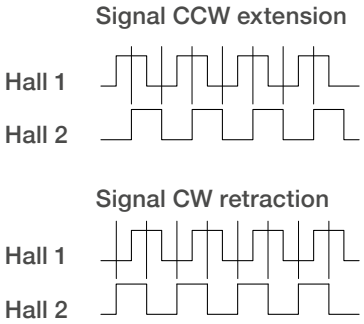
Potentiometer



Wire connection with encoder

Wire no.	AWG	Colour	Application	
1	26	Green	Sensor signal 1	Encoder
2	26	Yellow	Sensor signal 2	Encoder
3	26	Black	Sensor power GND	Encoder
4	26	Red	Sensor power 5 V	Encoder
5	14	Red	Motor power(+)=> Extension, (–)=> Retraction	
6	14	Black	Motor power(–)=> Extension, (+)=> Retraction	

Encoder

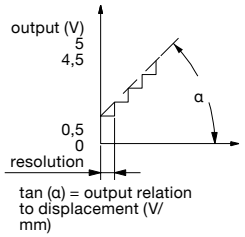


Wire connection with absolute analog output

Wire no.	AWG	Colour	Application
1	22	Green	Output signal
2	22	White	Sensor power GND
3	22	Brown	Sensor power +10~55 VDC
4	14	Red	Motor power(+)=> Extension, (–)=> Retraction
5	14	Black	Motor power(–)=> Extension, (+)=> Retraction

Absolut analog position output

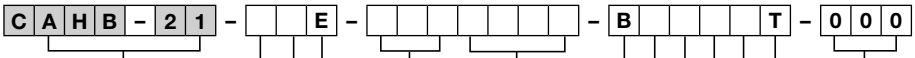
Input voltage:	10~55 V DC
Current consumpion:	15 mA max.
Output analog signal (voltage):	0~5 V DC
Max current output:	5 mA
Absolute analog output set up:	
retraction 0,5±0,15 V	
extension 4,5 to the maximum	



Output relation to displacement and resolution

Actuator type	Hall sensor [pulses/mm]	Potentiometer [ohm/mm]	Absolute analogue position output [V/mm]	Resolution of the absolute analog position output [mm]
CAHB-21...E	1,56	33,33 if S=050-222	0,0167 if S=050-222	0,0732 if S=050-222
		16,67 if S=223-444	0,0083 if S=223-444	0,1465 if S=223-444
		5,56 if S=445-700	0,0028 if S=445-700	0,4395 if S=445-700

Ordering key



Type

Voltage

12 V DC	A
24 V DC	B
48 V DC	D
12 V DC with manual override	E
24 V DC with manual override	F
48 V DC with manual override	H

Load

1 500 N	1
2 500 N	2
4 500 N	3

Design

E

Stroke

100 mm	100
150 mm	150
200 mm	200
250 mm	250
300 mm	300
350 mm	350
400 mm	400
450 mm	450
500 mm	500
600 mm	600
700 mm	700

Retracted length [1)]

Stroke	with limith switch without position output	with position output
100 mm	291	326
150 mm	341	376
200 mm	391	426
250 mm	441	476
300 mm	491	526
350 mm	576	611
400 mm	626	661
450 mm	676	711
500 mm	726	761
600 mm	826	861
700 mm	926	961
	without limith switch	
100 mm	282	317
150 mm	332	367
200 mm	382	417
250 mm	432	467
300 mm	482	517
350 mm	567	602
400 mm	617	652
450 mm	667	702
500 mm	717	752
600 mm	817	852
700 mm	917	952

Ingress protection

Standard: IP69K/IP66M — B

Attachment diameter: (Front and rear)

Hole Ø13,1 H11 (+0, +0,11 mm)	A
Hole Ø12,8 H11 (0, +0,11 mm)	B
Hole Ø12,5 H11 (+0, +0,11mm)	C
Hole Ø14 H11(+0,+0,11mm)	D
Hole 12.2 H11(+0,+0,11mm)	E
U fork hole 12.2 H11	F
U fork hole 12.8 H11	G
Customized	X

Attachment orientation

Standard (0°)	A
30°	B
60°	C
90°	D
120°	E
150°	F
Customized	X

Option 1: Limit switch

None (mandatory for 1 500 N, 2 500 N version and the 48 VDC version)	0
Limit switch (valid only for load version 4 500 in 12 or 24 V DC)	L

Option 2: Position output

None	0
Absolute analog output	A
Potentiometer	P
Encoder	E

Thermal protection

Standard: Built-in thermal switch — T

Customization

Stroke length, retracted length, cable, connector, front attachment, rear attachment, color, de-rated load

[1)] Retracted length +12mm when attachments U fork are used.
In standard, the actuators are IP69K / IP66M and equipped with GORE Automotive vent, built-in thermal protection, protection Clutch and EMC filter.

CAHB-22E

Linear actuator

Benefits

- High productivity
- Reliability and safety
- Save development time
- Cost effectiveness

Features

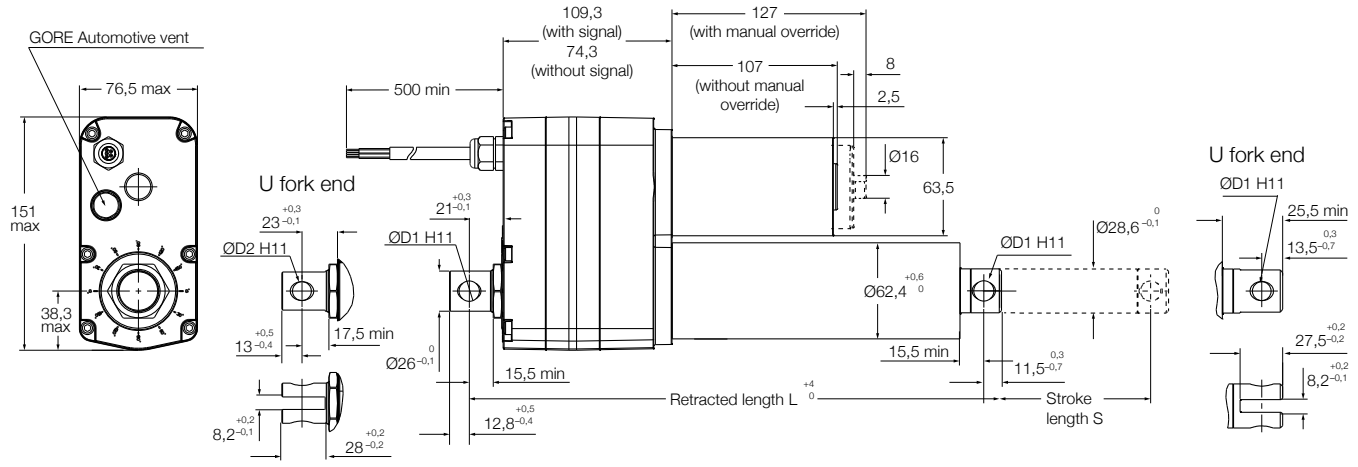
- High force
- High speed
- High holding force
- Mechanical overload protection
- Enhanced ingress protection
- Corrosion protection and stainless steel tube
- Manual override option
- Virtuality maintenance free

Technical data

Designation	Unit	CAHB-22E / 12 V				CAHB-22E / 24 V			
Performance data									
Rated Push Force	N	2 300	3 500	6 800	10 000	2 300	3 500	6 800	10 000
Rated Pull Force	N	2 300	3 500	6 800	10 000	2 300	3 500	6 800	10 000
Max pull / push Force[1)]	N	3 500	4 900	9 500	14 000	3 500	4 900	9 500	14 000
Holding force[2)]	N								
Speed without load	mm/s	55,0	45,0	22,0	13,0	53,0	45,0	22,0	13,0
Speed with the rated force	mm/s	42,0	36,0	15,5	10,2	42,0	37,0	17,0	10,2
Electric data									
Nominal voltage	V DC	12	12	12	12	24	24	24	24
Nominal current @ rated load	A	18	19,5	19,5	19	8	9,5	9,5	8,5
Rated current (clutch activation)	A	24,3	25,5	25,5	25	10,6	12,3	12,3	10,9
Duty cycle	%	10% (85/765 s)	10% (85/765 s)	10% (85/765 s)	10% (85/765 s)	20% (85/340 s)	20% (85/340 s)	20% (85/340 s)	20% (85/340 s)
Mechanical data									
Stroke	mm	50 … 700	50 … 700	50 … 610	50 … 450	50 … 700	50 … 700	50 … 610	50 … 450
Backlash	mm	1,0	1,0	0,6	0,6	1,0	1,0	0,6	0,6
Weight for 200 mm stroke	kg	4,8	4,8	4,8	4,8	4,8	4,8	4,8	4,8
Colour	–	Black	Black	Black	Black	Black	Black	Black	Black
Environment and standards									
Ambient temperature	°C	–40 … 85	–40 … 85	–40 … 85	–40 … 85	–40 … 85	–40 … 85	–40 … 85	–40 … 85
Degree of protection	–	IP 69K/66M							
Standards / EMC	–	EN61000-6-2:2005, EN61000-6-4:2007/A1:2011							
Salt spray test	–	ISO 9227:2012, 250 hours							

[1)] Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits
[2)] Ultimate Static Load, refer to the “Static load” diagrams

Dimensional drawing



	Rod end attachment (D1)					U fork attachment (D2)	
Holes symbol	A	B	C	D	E	F	G
Hole dimension	13,1	12,8	12,5	14	12,2	12,2	12,8

	Rod end attachment		U fork attachment	
S Stroke [mm]	50-305	306-700	50-305	306-700
L_1 retracted length no option	194 + stroke	229 + stroke	206 + stroke	241 + stroke
L_1 retracted length with LS	200 + stroke	235 + stroke	212 + stroke	247 + stroke
L_1 retracted length with signal	229 + stroke	264 + stroke	241 + stroke	276 + stroke
L_1 retracted length sith LS and signal	235 + stroke	270 + stroke	247 + stroke	282 + stroke

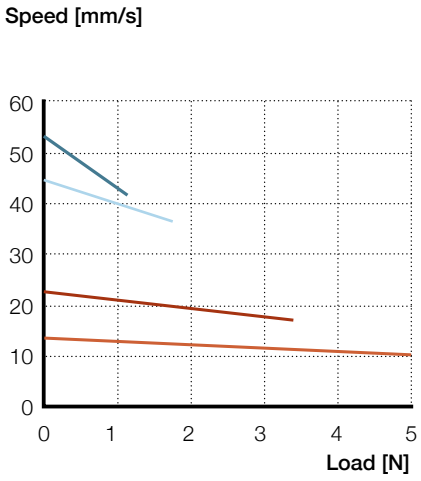
Tolerance L_2: Stroke S
[1] Tolerance S, if S ≤300 (±2); if S >300 (±3)
[2] Tolerance S, if S ≤300 (–2, –0,5); if S >300 (–3, –1)

Technical data

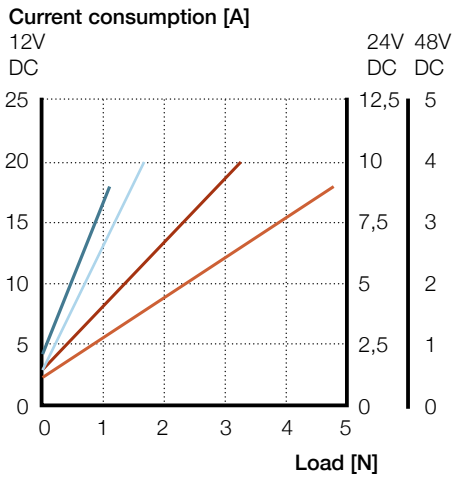
Designation	Unit	CAHB-22E / 48 V			
Performance data					
Rated Push Force	N	2 300	3 500	6 800	10 000
Rated Pull Force	N	2 300	3 500	6 800	10 000
Max pull / push Force[1]	N	3 500	4 900	9 500	14 000
Holding force[2]	N				
Speed without load	mm/s	57,0	45,0	22,0	13,0
Speed with the rated force	mm/s	50,0	37,0	18,5	10,2
Electric data					
Nominal voltage	V DC	48	48	48	48
Nominal current @ rated load	A	4,5	5	5	5
Rated current (clutch activation)	A	6,5	7	7	5,5
Duty cycle	%	20% (85/340 s)	20% (85/340 s)	20% (85/340 s)	20% (85/340 s)
Mechanical data					
Stroke	mm	50 … 700	50 … 700	50 … 610	50 … 450
Backlash	mm	1,0	1,0	0,6	0,6
Weight for 200 mm stroke	kg	4,8	4,8	4,8	4,8
Colour	–	Black	Black	Black	Black
Environment and standards					
Ambient temperature	°C	–40 … 85	–40 … 85	–40 … 85	–40 … 85
Degree of protection	–	IP 69K/66M			
Standards / EMC	–	EN61000-6-2:2005, EN61000-6-4:2007/A1:2011			
Salt spray test	–	ISO 9227:2012, 250 hours			

Performance diagrams

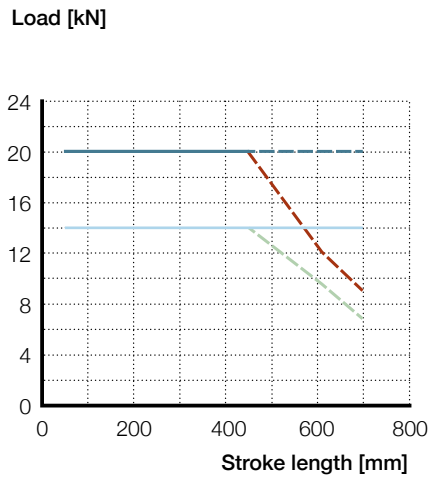
Speed-load diagram



Current load diagram



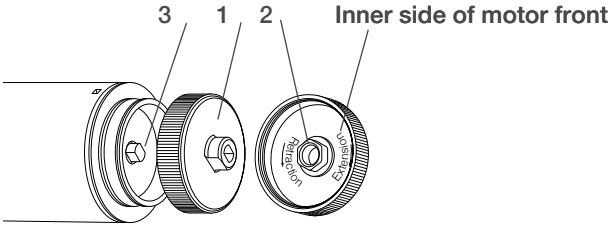
Static load diagram



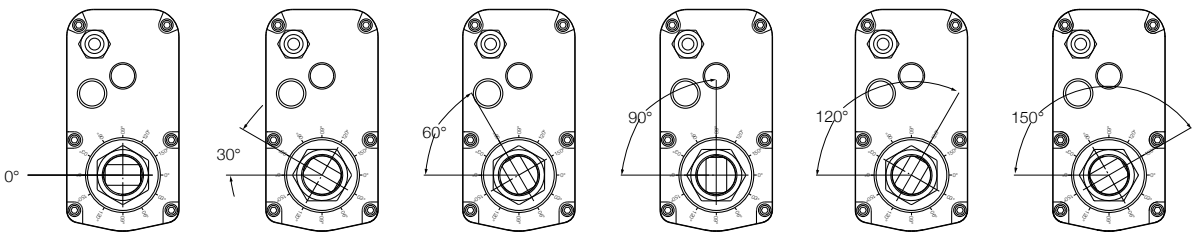
- Rated push force 2 300
- Rated push force 3 500
- Rated push force 6 800
- Rated push force 10 000
- Ultimate CAHB-22-xxE (push)
- Ultimate CAHB-22-xxE (pull)
- Recommended CAHB 22-xxE (push)
- Recommended CAHB 22-xxE (pull)

Manual override

Release the motor cover (1). Use the slot (2) to rotate the motor shaft (3) in the proper direction



Attachment



Electrical specifications

Wire connection with no signal

Wire no.	AWG	Colour	Application
1	14	Red	Motor power(+)=> Extension, (–)=> Retraction
2	14	Black	Motor power(–)=> Extension, (+)=> Retraction

Wire connection with potentiometer

Wire no.	AWG	Colour	Application
1	22	Green	See picture description
2	22	White	See picture description
3	22	Brown	See picture description
4	14	Red	Motor power(+)=> Extension, (–)=> Retraction
5	14	Black	Motor power(–)=> Extension, (+)=> Retraction

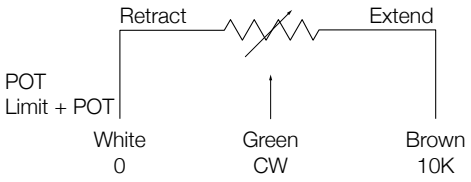
Wire connection with encoder

Wire no.	AWG	Colour	Application	
1	26	Green	Sensor signal 1	Encoder
2	26	Yellow	Sensor signal 2	Encoder
3	26	Black	Sensor power GND	Encoder
4	26	Red	Sensor power 5 V	Encoder
5	14	Red	Motor power(+)=> Extension, (–)=> Retraction	
6	14	Black	Motor power(–)=> Extension, (+)=> Retraction	

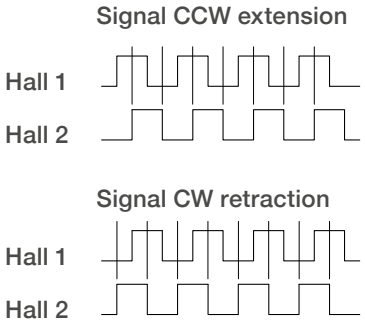
Wire connection with absolute analog output

Wire no.	AWG	Colour	Application
1	22	Green	Output signal
2	22	White	Sensor power GND
3	22	Brown	Sensor power +10~55 VDC
4	14	Red	Motor power(+)=> Extension, (–)=> Retraction
5	14	Black	Motor power(–)=> Extension, (+)=> Retraction

Potentiometer

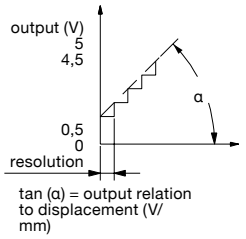


Encoder



Absolut analog position output

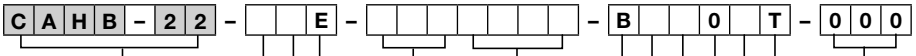
Input voltage:	10~55 V DC
Current consumpion:	15 mA max.
Output analog signal (voltage):	0~5 V DC
Max current output:	5 mA
Absolute analog output set up:	
retraction 0,5±0,15 V	
extension 4,5 to the maximum	



Output relation to displacement and resolution

Actuator type	Hall sensor [pulses/mm]	Potentiometer [ohm/mm]	Absolute analogue position output [V/mm]	Resolution of the absolute analog position output [mm]
CAHB-22...1E	1,4	30 if S=050-254	0,0150 if S=050-254	0,0814 if S=050-254
CAHB-22...2E	1,4	15 if S=255-508	0,0075 if S=255-508	0,1638 if S=255-508
		5 if S=509-700	0,0025 if S=509-700	0,4883 if S=509-700
CAHB-22...3E	2,8	60 if S=050-254	0,030 if S=050-254	0,0407 if S=050-254
CAHB-22...4E	2,8	30 if S=255-508	0,015 if S=255-508	0,0814 if S=255-508
		10 if S=509-700	0,005 if S=509-700	0,2441 if S=509-700

Ordering key



Type

Voltage

12 V DC	A
24 V DC	B
48 V DC	D
12 V DC with manual override	E
24 V DC with manual override	F
48 V DC with manual override	H

Load

2 300 N	1
3 500 N	2
6 800 N	3
10 000 N	4

Design

E

Stroke

100 mm	100
150 mm	150
200 mm	200
250 mm	250
300 mm	300
350 mm	350
400 mm	400
450 mm	450
500 mm	500
600 mm	600
700 mm	700

Retracted length [1)]

Stroke	with limith switch without position output	with position output
100 mm	300	335
150 mm	350	385
200 mm	400	435
250 mm	450	485
300 mm	500	535
350 mm	585	620
400 mm	635	670
450 mm	685	720
500 mm	735	770
600 mm	835	870
700 mm	935	970
	without limith switch	
100 mm	294	329
150 mm	344	379
200 mm	394	429
250 mm	444	479
300 mm	494	529
350 mm	579	614
400 mm	629	664
450 mm	679	714
500 mm	729	764
600 mm	829	864
700 mm	929	964

Ingress protection

Standard: IP69K/IP66M — B

Attachment diameter: (Front and rear)

Hole Ø13,1 H11 (+0, +0,11 mm)	A
Hole Ø12,8 H11 (0, +0,11 mm)	B
Hole Ø12,5 H11 (+0, +0,11 mm)	C
Hole Ø14 H11(+0, +0,11mm)	D
Hole Ø12,2 H11(+0,+0,11mm)	E
U fork hole 12.2 H11	F
U fork hole 12.8 H11	G
Customized	X

Attachment orientation

Standard (0°)	A
30°	B
60°	C
90°	D
120°	E
150°	F
Customized	X

Option 1: Limit switch

None (mandatory for 2 300 N and 3 500 N version and the 48 V DC version)	0
Limit switch (valid only for load version 6 800 N and 10 000 N, not mandatory for 10 000 N in 12 or 24 VDC)	L

Option 2: Position output

None	
Absolute analog output	P
Potentiometer	0
Encoder	E

Thermal protection

Standard: Built-in thermal switch — T

Customization

Stroke length, retracted length, cable, connector, front attachment, rear attachment, color, de-rated load

[1)] Retracted length +12mm when attachments U fork are used.
In standard, the actuators are IP69K / IP66M and equipped with GORE Automotive vent, built-in thermal protection, protection Clutch and EMC filter.

CAHB-30A

Linear actuator

Benefits

- ACME screw drive
- Extension tube (stainless steel)
- Protection tube (steel)
- Enhanced corrosion resistance
- Mechanical overload protection (clutch)
- Maintenance free
- Robust, designed for tough environment
- Self-locking
- Motor with thermal protection

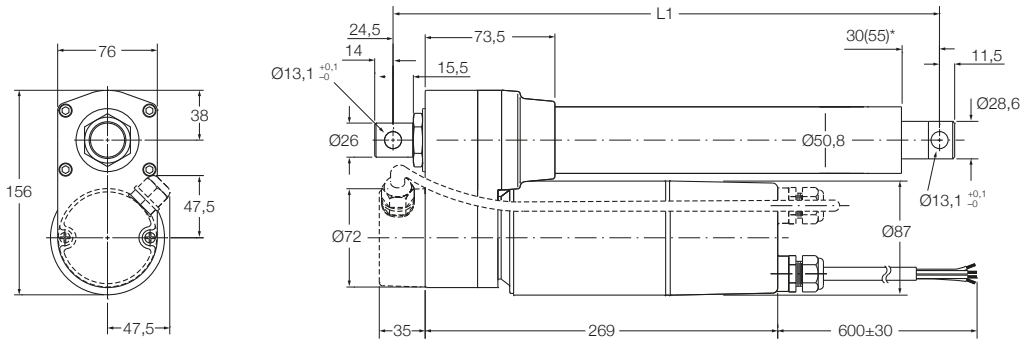
Technical data

		Unit	CAHB–30A... 1	CAHB–30A... 2
Rated push load		N	1 500	2 300
Rated pull load		N	1 500	2 300
Speed (full load to no load)	115 V AC/60 Hz	mm/s	25 to 26	12 to 13
	230 V AC/50 Hz	mm/s	21 to 22	11 to 12
Stroke		mm	102 to 610	102 to 610
Retracted length		mm	–[1)]	–[1)]
Voltage		V AC	115 or 230	115 or 230
Power consumption		W	N/A	N/A
Current consumption	115 V AC/60 Hz	A	2,3	1,8
	230 V AC/50 Hz	A	1,35	1,4
Duty cycle		%	25 (94/376 s)	25 (94/376 s)
Ambient temperature		°C	–26 to +65	–26 to +65
Type of protection		IP	65S	65S
Weight		kg	9	9
Color		–	Black	Black

[1)] See dimensional drawing ↳ **page 31**
For outdoors application, please contact Ewellix.

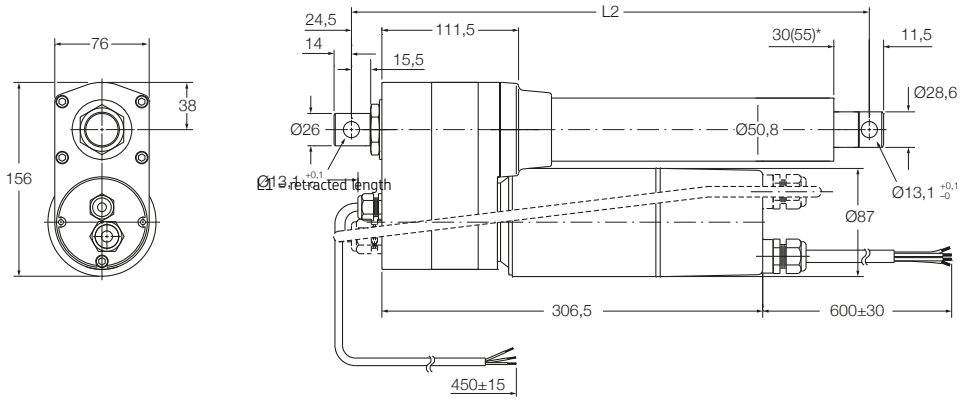
Dimensional drawing

Basic configuration (dashed line for optional limit switch)

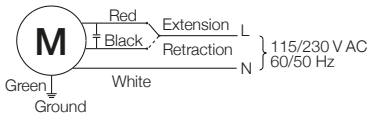


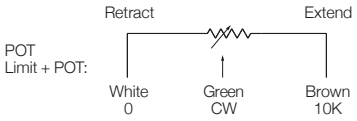
Legend
L1 = retracted length
* 55 = dimension
with limit switch

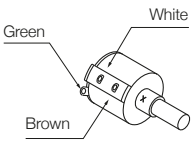
Optional potentiometer (dashed line for optional limit switch)



Legend
L2 = retracted length
* 55 = dimension
with limit switch

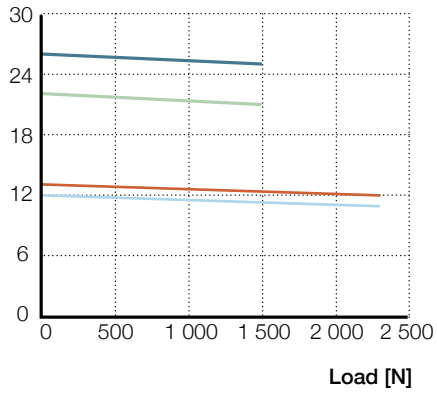




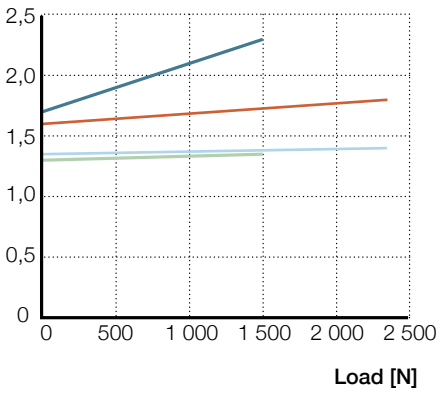


Performance diagrams

Speed-load diagram



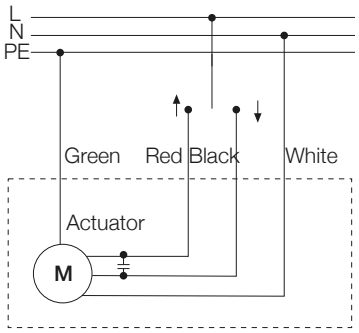
Current-load diagram



1 (115 VAC) 1 (230 VAC) 2 (115 VAC) 2 (230 VAC)

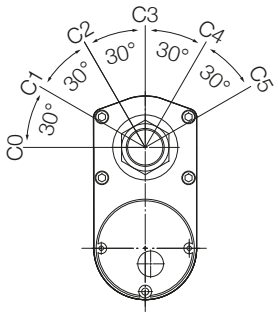
Connecting diagram

115/230 V AC, 50/60 Hz



Different rear attachment

C0–C5



Electrical specifications

Basic configuration

	With limit switch[1]						Without limit switch[2]					
Stroke (mm)	102	153	204	305	457	610	102	153	204	305	457	610
L1 Retracted length	440	440	440	592	744	897	380	415	415	465	668	821

[1] Tolerance: S and L1 = ± 5,0 mm (If S≥305 mm, S = ± 7,5 mm)
[2] Tolerance: S = ± 2,5 mm and L1 = ± 3,8 mm

Optional potentiometer

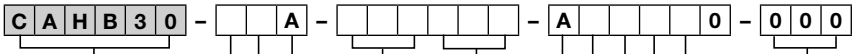
	With limit switch[1]						Without limit switch[2]					
Stroke (mm)	102	153	204	305	457	610	102	153	204	305	457	610
L2 Retracted length	478	478	478	630	782	935	418	453	453	503	706	859

[1] Tolerance: S and L2 = ± 5,0 mm (If S≥305 mm, S = ± 7,5 mm)
[2] Tolerance: S = ± 2,5 mm and L2 = ± 3,8 mm

Potentiometer resolution

Stroke (mm)	102	153	204	305	457	610
Ohm/mm	59,0	59,0	29,5	29,5	9,84	9,84

Ordering key



Type

Voltage

115 V AC	N
230 V AC	P

Load

1 500 N	1
2 300 N	2

Screw

Acme screw	A

Stroke

102 mm	102
153 mm	153
204 mm	204
305 mm	305
457 mm	457
610 mm	610

Retracted length

Stroke	with limith switch1)	without POT2)	with POT2)
102 mm		440	478
153 mm		440	478
204 mm		440	478
305 mm		592	630
457 mm		744	782
610 mm		897	935
	without limith switch1)		
102 mm		380	418
153 mm		415	453
204 mm		415	453
305 mm		465	503
457 mm		668	706
610 mm		821	859

IP

Standard (IP 65)	A

Front attachment

Standard (hole: Ø 13,1 mm)	A
Customized	X

Rear attachment

Standard (0° and hole: Ø 13,1 mm)	A
30°	B
60°	C
90°	D
120°	E
150°	F
Customized	X

Option 1:

None	0
Limit switch (only for load version 2 300 N)	L

Option 2:

None	0
Potentiometer	P

Customization

Options shown in yellow are only available on request. Contact Ewellix for more information on minimum quantities and additional costs.

CAHB-31N

Linear actuator

Benefits

- High efficiency ball screw
- Extension tube (stainless steel)
- Protection tube (steel)
- Enhanced corrosion resistance
- Mechanical overload protection (clutch)
- Lubricated for service life
- Robust, designed for tough environment
- No back driving
- Motor with thermal protection

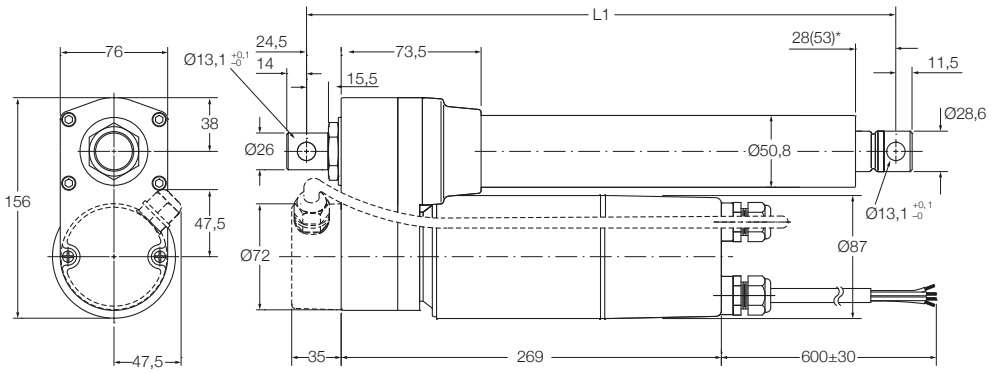
Technical data

		Unit	CAHB–31N... 1	CAHB–31N... 2	CAHB–31N... 3
Rated push load		N	2 300	4 500	6 000
Rated pull load		N	2 300	4 500	6 000
Speed (full load to no load)	115 V AC/60 Hz	mm/s	48 to 57	22 to 28	13 to 15
	230 V AC/50 Hz	mm/s	40 to 50	20 to 24	11 to 13
Stroke		mm	102 to 610	102 to 610	102 to 610
Retracted length		mm	–[1)]	–[1)]	–[1)]
Voltage		V AC	115 or 230	115 or 230	115 or 230
Power consumption		W	N/A	N/A	N/A
Current consumption	115 V AC/60 Hz	A	3	2,6	2,2
	230 V AC/50 Hz	A	1,5	1,4	1,4
Duty cycle		%	25 (94/376 s)	25 (94/376 s)	25 (94/376 s)
Ambient temperature		°C	–26 to +65	–26 to +65	–26 to +65
Type of protection		IP	65S	65S	65S
Weight		kg	9,5	9,5	9,5
Color		–	Black	Black	Black

1) See dimensional drawing ↳ **page 35**
For outdoors application, please contact SKF Motion Technologies.

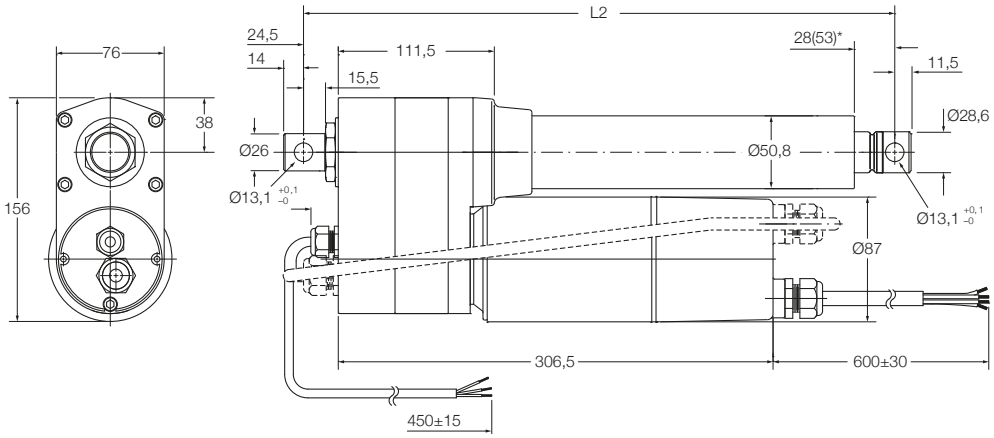
Dimensional drawing

Basic configuration (dashed line for optional limit switch)

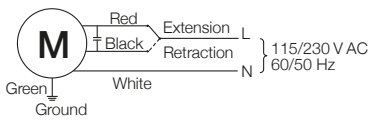


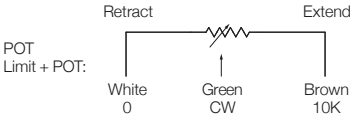
Legend
L1 = retracted length
* 53 = dimension
with limit switch

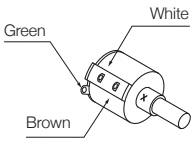
Optional potentiometer (dashed line for optional limit switch)



Legend
L2 = retracted length
* 53 = dimension
with limit switch



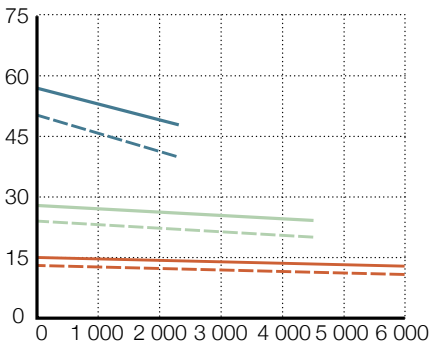




Performance diagrams

Speed-load diagram

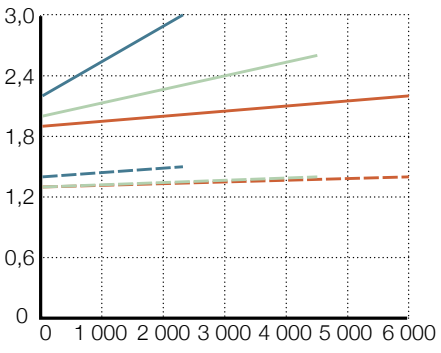
Speed [mm/s]



Load [N]

Current-load diagram

Current consumption [A]

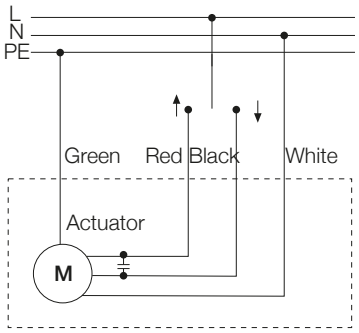


Load [N]

1 (115 VAC) — 2 (115 VAC) — 3 (115 VAC)
1 (230 VAC) — 2 (230 VAC) — 3 (230 VAC)

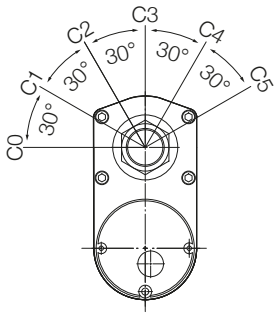
Connecting diagram

115/230 V AC, 50/60 Hz



Different rear attachment

C0–C5



Electrical specifications

	With limit switch[1]						Without limit switch[2]					
Stroke (mm)	102	153	204	305	457	610	102	153	204	305	457	610
L1 Retracted length	444	444	495	659	811	964	380	419	419	521	735	888

[1] Tolerance: S and L1 = ± 5,0 mm (If S≥305 mm, S = ± 7,5 mm)
[2] Tolerance: S = ± 2,5 mm and L1 = ± 3,8 mm

Basic configuration

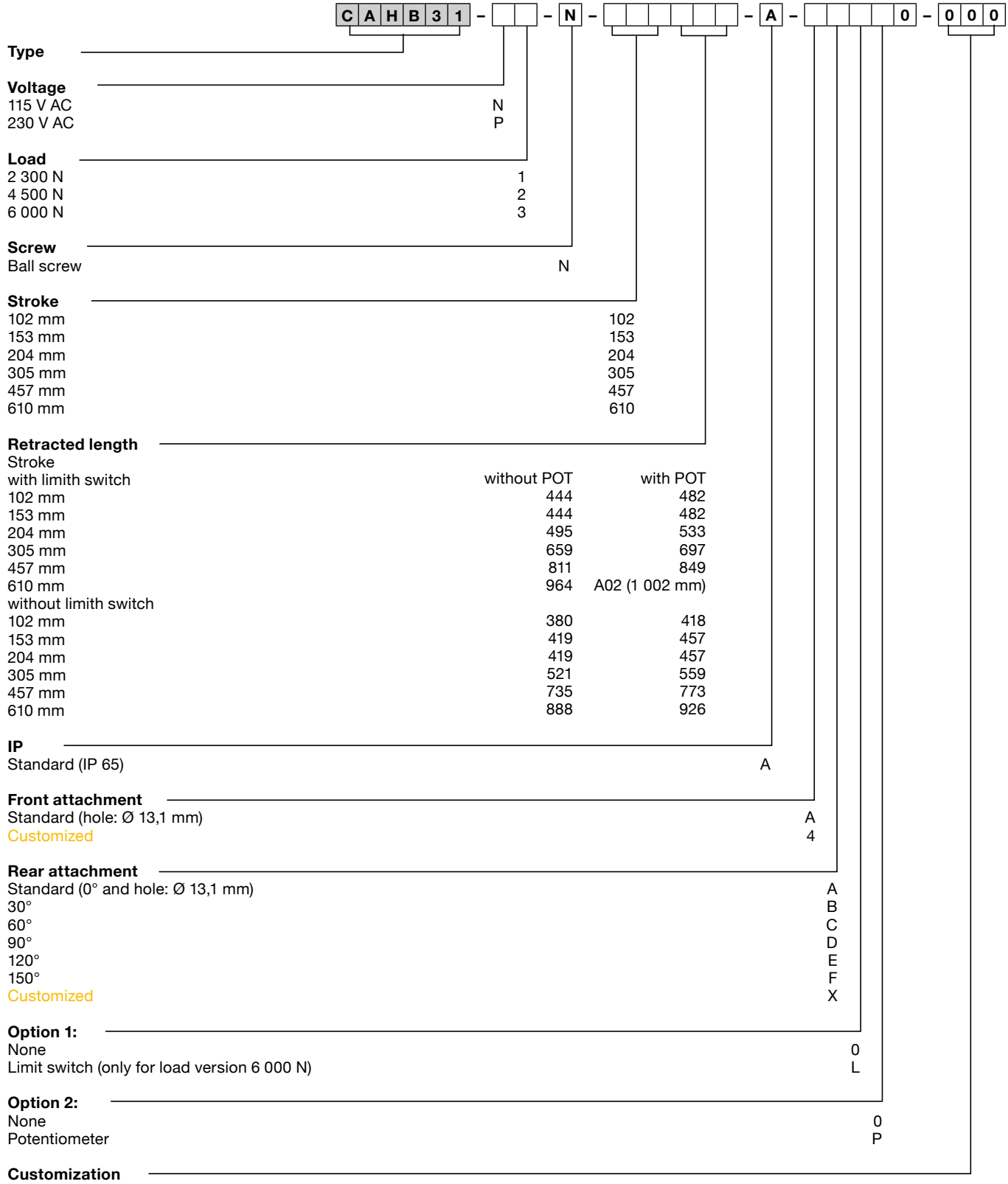
	With limit switch[1]						Without limit switch[2]					
Stroke (mm)	102	153	204	305	457	610	102	153	204	305	457	610
L2 Retracted length	482	482	533	697	849	1002	418	457	457	559	773	926

[1] Tolerance: S and L2 = ± 5,0 mm (If S≥305 mm, S = ± 7,5 mm)
[2] Tolerance: S = ± 2,5 mm and L2 = ± 3,8 mm

Potentiometer resolution

Stroke (mm)	102	153	204	305	457	610
Ohm/mm	59,0	59,0	29,5	29,5	9,84	9,84

Ordering key



Options shown in yellow are only available on request. Contact Ewellix for more information on minimum quantities and additional costs.

CAHB series - Environmental tests

Climatic tests

Test and Standard	CAHB-20xE, CAHB-21xE, CAHB-22xE Performance	Report No.	CAHB-10 Performance	Report No.	CAHB-30, CAHB-31 Performance	Report No.
Cold test EN60068-2-1 (Ab)	Storage at low temperature Temperature: –40 °C Duration: 6 hours Not connected Tested at room temperature.	PH_TR0295	Storage at low temperature Temperature: –40 °C Duration: 96 hours Not connected Tested at room temperature.	"Low temperature for CAHB-10"	Storage at low temperature: Temperature: –40 °C Duration: 8 hours Not connected Tested at room temperature.	PH_TR0265
Cold test EN60068-2-1 (Ad)	Storage at low temperature Temperature: –30 °C Duration: 6 hours Actuator is not activated/ connected Tested at low temperature.	PH_TR0295	Storage at low temperature Temperature: –20 °C Duration: 96 hours Actuator is not activated/ connected Tested at low temperature.	"Low temperature for CAHB-10"	Storage at low temperature: Temperature: –26 °C Duration: 8 hours Not connected Tested at room temperature.	PH_TR0265
Dry Heat EN60068-2-2 (Bb)	Storage at high temperature Temperature: +90 °C Duration: 72 hours Actuator is not activated/ connected. Tested at room temperature	PH_TR0278	Storage at high temperature Temperature: +85 °C Duration: 96 hours Actuator is not activated/ connected. Tested at room temperature	"High temperature for CAHB-10"	–	–
Change of temperature EN60068-2-14 (Na)	Rapid change of temperature High temperature: +100 °C in 60 min. Low temperature: –30 in 60 min. Transition time: < 10 seconds Duration: 100 cycles Actuator is not activated/ connected. Tested at room temperature.	PH_TR0278	–	–	–	–
Salt mist EN60068-2-52 (Kb)	Salt spray test Salt solution: 5% sodium chloride (NaCl) 4 spraying periods, each of 2 hours. Humidity storage 7 days after each. Actuator not activated/ connected. Exposure time: 250 hours	PH_TR0268	Salt spray test Salt solution: 5% sodium chloride (NaCl) 4 spraying periods, each of 2 hours. Humidity storage 7 days after each. Actuator not activated/ connected. Exposure time: 96 hours	"Salt spray test for CAHB-10"	–	–
Degrees of protection IEC 60529	1. Test Item: IP6XM Test Condition: Movement Test Dust: Talcum powder Dust Concentration: 2 kg/m^3 chamber volume and be kept in suspension during the test Test Duration: 8 hours	SHIN1607036235PS	1. Test Item: IP6XS Test Condition: Static Type of dust: Talcum powder Test Duration: 8 hours	COM12-GPE080184AN, COM12-GPE080183AN	–	–
Degrees of protection IEC 60529	2. Test Item: IPX6M Test Condition: Movement Flux: 100 L/min Nozzle diameter: Ø 12,5 mm Distance: 2,5 ~ 3,0 m Test duration: 3 min	SHIN1607036235PS	2. Test Item: IPX6S Test Condition: Static Flux: 100 (1 ±5%) L/min Nozzle diameter: Ø 12,5 mm Distance: 2,5 ~ 3,0 m Test duration: 3 min	COM12-GPE080184AN, COM12-GPE080183AN	2. Test Item: IPX5S Test Condition: Static Flux: 12,5 L/min Nozzle diameter: Ø 6,3 mm Distance: 2,5 ~ 3,0 m Test duration: 3 min	SHIN1608042057MR
Degrees of protection ISO 20653:2013	3. Test Item: IPX9K Test Condition: Static Jet angle: 2507 Water flow: 14~16 L/min Water pressure: 8 000~10 000 kPa Water temperature: 80 to -5 °C Test angle: 0°, 30°, 60°, 90° Test distance from jet to sample: 100~150 mm Test duration: 30 s/position	SHIN1607036235PS	3. Test Item: IPX9K Test Condition: Static Jet angle: 2507 Water flow: 14~16 L/min Water pressure: 8 000~10 000 kPa Water temperature: 80 to -5 °C Test angle: 0°, 30°, 60°, 90° Test distance from jet to sample: 100~150 mm Test duration: 30 s/position	SHIN1510048959MR-01	–	–

Mechanical tests

Test and Standfards	CAHB-20xE, CAHB-21xE, CAHB-22xE Performance	Report No.	CAHB-10 Performance	Report No.	CAHB-30, CAHB-31 Performance	Report No.
Vibration EN60068-2-6 (Fdb) EN60068-w2-6(Fc)	Test Item: Random vibration Frequency (Hz) (g2/Hz) / Power spectral density level 10 / 0,005 200 / 0,02 300 / 0,01 350 / 0,002 Test Direction: X/Y/Z axis Test Duration: 2 hours/axis, Total 6 hours Test Item: Sinusoidal vibration Test Condition: Frequency range: 5~25~200 Hz Amplitude: 3,3 mm (p-p) Acceleration: 4g Sweep Rate: 1O ct/min Test Direction: X/Y/Z axis Test Duration: 2 hours/axis, Total 6 hours	SHIN1607036235PS SHIN1702007025PS	–	–	–	–
Vibration Ewellix Specified Conditions	–	–	Test Item: Vibration Set Point (Grms) / Dwell Time(min) 5 / 10 10 / 10 15 / 10 20 / 10 20 / 20 20 / 30 Test Equipment Name Halt Tester / Typhoon-2,5+	SHIN1805034119SC SHIN1805032588SC	–	–

Electrical tests

Test and Standars	CAHB-20xE, CAHB-21xE, CAHB-22xE Performance	Report No.	CAHB-10 Performance	Report No.	CAHB-30, CAHB-31 Performance	Report No.
Power supply 12 VDC ASAE EP455 (1990)	Operating voltages: +10 V ~ +16 V Over voltage: +26 V / 5 min. Reverse polarity: –26 V / 5 min. Short circuit to ground: 16 V / 5 min. Short circuit to supply: 16 V	PH_TR0267 PH_TR0302	–	–	–	–
Power supply 24 VDC ASAE EP455 (1990)	Operating voltages: +21 V ~ +26 V Over voltage: +36 V / 5 min Reverse polarity: –36 V / 5 min Short circuit to ground: 32 V / 5 min Short circuit to supply: 32 V	PH_TR0267 PH_TR0302	–	–	–	–
Safety Low Voltage Directive EN 60335-1: 2012 + A11: 2014	–	–	–	–	Rated Voltage: 230 V AC Rated frequency: 50 Hz Rated Current: 1,5 A Degree of protection: IP65	UL 4787638796
EN 60335-2-97 : 2006 + A11: 2008 + A2:2010 + A12: 2015 EN 62233 : 2008	–	–	–	–	Rated Voltage: 230 V AC Rated frequency: 50 Hz Rated Current: 1,5 A Degree of protection: IP65	UL 4787638796
EMC, HF-immunity EN 61000-6-1	–	–	Pass the test for 12 V / 24 V Motor	70.888.12.1063.02	–	–
EN 61000-6-2	Pass the test for 12 V / 24 V Motor	708881688102-00				
EMC, Emission EN 61000-6-3	–	–	Inside limits for 12 V / 24 V motor	70.888.12.1063.02	–	–
EN 61000-6-4	Inside limits for 12 V / 24 V motor	708881688102-00	–	–	–	–
EN 50081-2 (1993) EN 55011 (1998)	–	–	–	–	Class B	EM99777 (IA4=CAHB-30 CAHB-31 series
EMC, Automotive transients ISO 7637-2	ISO 7637 Load dump test only accepted on motor power connection	708881688103-00	–	-	–	–

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