

**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 override.



## Features

- Long stroke and high speed
- High holding force up to 20 000 N
- Absolute or incremental Position feedback and limit switches option
- Low backlash
- 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-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)



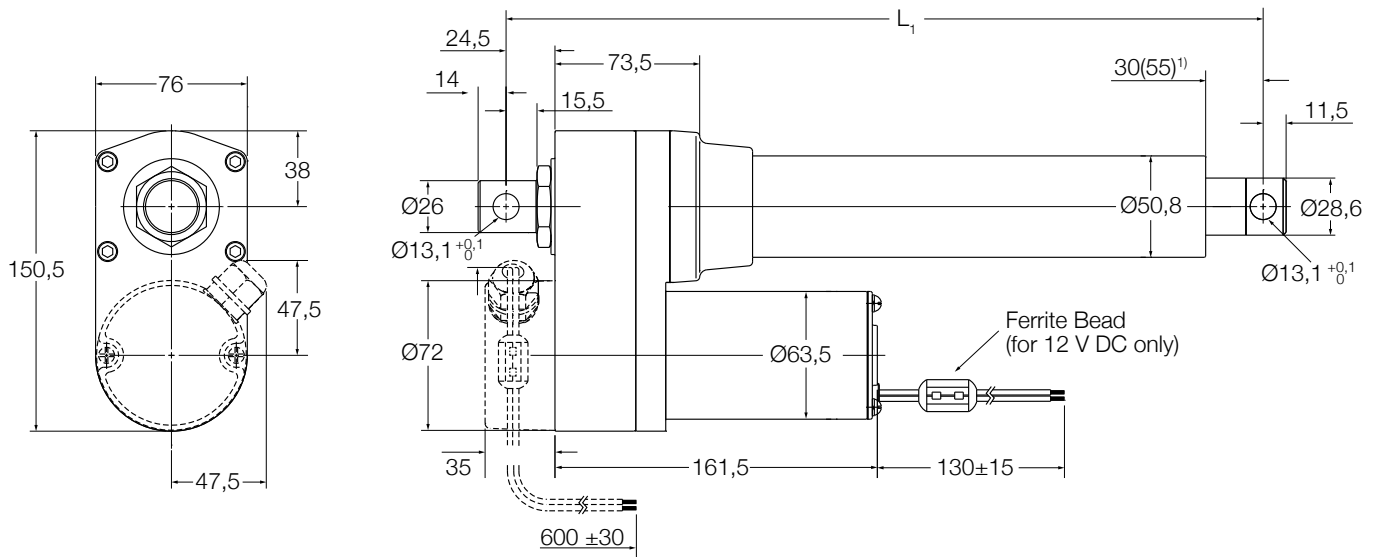
### Technical data

Designation	Unit	CAHB-20... 1	CAHB-20... 2
<b>Performance data</b>			
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 <sup>-1)</sup> <sub>-1)</sub>	mm	<sup>-1)</sup>	<sup>-1)</sup>
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

<sup>1)</sup> See dimensional drawing (↳ page 11 and 12)

## Dimensional drawing

### Basic configuration (dashed line for optional limit switch)



**Without limit switch:**

RED (+) & BLACK (-) = retraction  
 RED (-) & BLACK (+) = extension

**With limit switch:**

RED (+) & BLACK (-) = extension  
 RED (-) & BLACK (+) = retraction

**Legend:**

$L_1$  = retracted length  
 ¹55 = 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

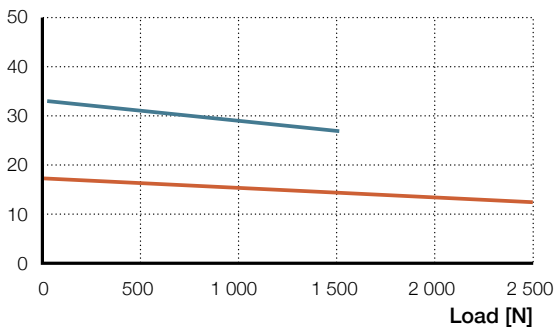
¹) Tolerance: S and  $L_1 = \pm 5,0$  mm (if  $S \geq 305$  mm,  $S = \pm 7,5$  mm)

²) Tolerance: S =  $\pm 2,5$  mm and L =  $\pm 3,8$  mm

## Performance diagrams

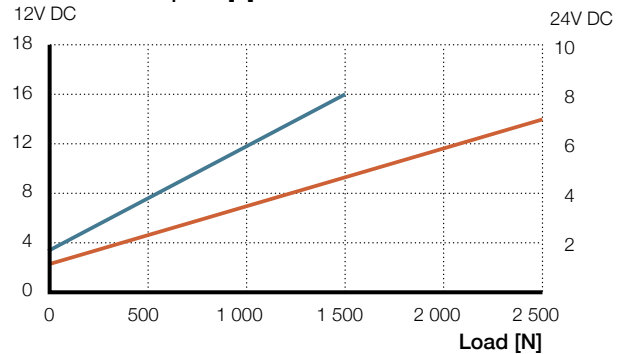
### Speed-load diagram

Speed [mm/s]



### Current-load diagram

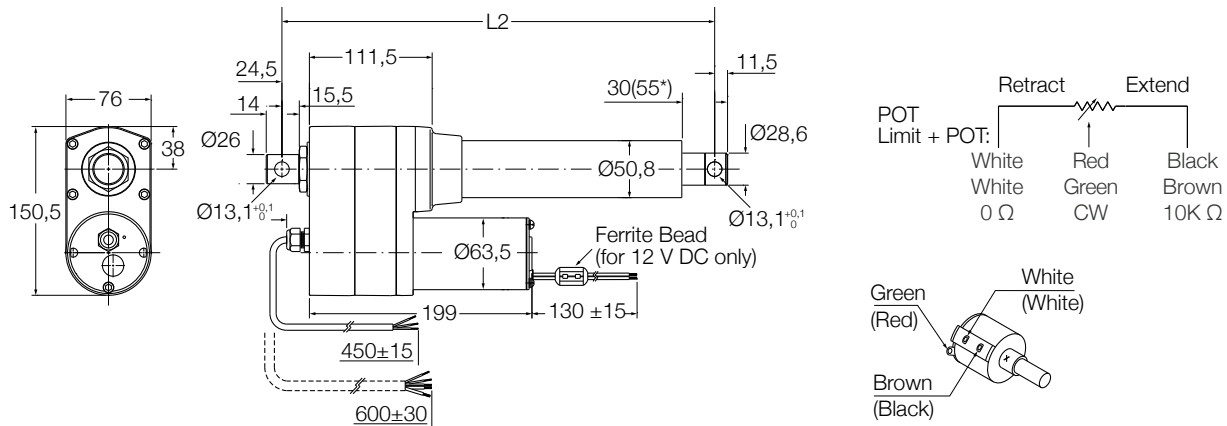
Current consumption [A]



— CAHB-20...1      — CAHB-20...2

### Dimensional drawing

Optional potentiometer (dashed line for optional limit switch)



**Without limit switch:**  
 RED (+) & BLACK (-) = retraction  
 RED (-) & BLACK (+) = extension

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

**Legend:**  
 L2 = retracted length  
<sup>1</sup>55 = dimension with limit switch

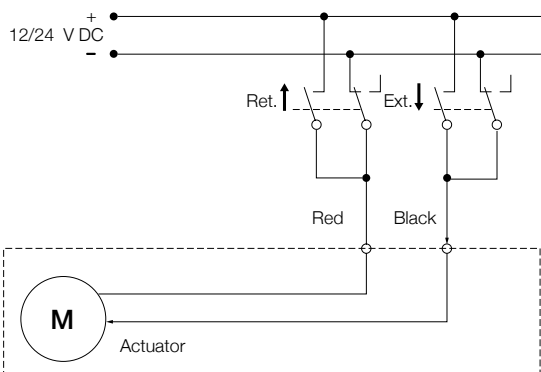
	With limit switch <sup>1)</sup>						Without limit switch <sup>2)</sup>					
Stroke [mm]	102	153	204	305	457	610	102	153	204	305	457	610
L <sub>1</sub> Retracted length	376	427	478	630	782	935	300	351	402	503	706	859

<sup>1)</sup> Tolerance: S and L1 = ± 5,0 mm (If S ≥ 305 mm, S = ± 7,5 mm)  
<sup>2)</sup> Tolerance: S = ± 2,5 mm and L2 = ± 3,8 mm

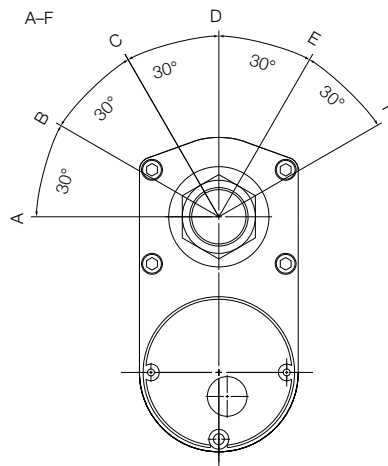
### Potentiometer resolution

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

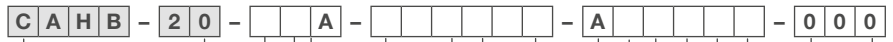
### Connecting diagram



### Different rear attachment



## Ordering key



**Type**

**Voltage**

- A 12 V DC
- B 24 V DC

**Load**

- 1 1 500 N
- 2 2 500 N

**Design**

**Stroke**

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

**Retracted length**

Stroke	with limit switch	without POT	with POT
102 mm		338	376
153 mm		389	427
204 mm		440	478
305 mm		592	630
457 mm		744	782
610 mm		897	935
	without limit switch		
102 mm		262	300
153 mm		313	351
204 mm		364	402
305 mm		465	503
457 mm		668	706
610 mm		821	859

**Ingress protection**

- A Standard: IP66

**Front attachment**

- A Standard (Standard (hole: Ø13,1 mm))
- X Customized

**Rear attachment**

- A Standard (0° and hole: Ø13,1 mm)
- B 30°
- C 60°
- D 90°
- E 120°
- F 150°
- X Customized

**Option 1**

- 0 None
- L Limit switch (only for load version 2 500 N)

**Option 2**

- 0 None
- P Potentiometer

**Option 3**

- 0 None
- T Thermal protection

**Customization**

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		
<b>Performance data</b>							
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 <sup>1)</sup>	N	2 600	3 800	6 300	2 600	3 800	6 300
Holding force <sup>2)</sup>	N						
Speed without load <sup>3)</sup>	mm/s	27,0	23,5	13,5	29,0	22,0	13,0
Speed with the rated force <sup>3)</sup>	mm/s	24,5	17,5	10,5	25,5	19,0	11,0
<b>Electric data</b>							
Nominal voltage	V DC	12	12	12	24	24	24
Nominal current @ rated load <sup>3)</sup>	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)
<b>Mechanical data</b>							
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
<b>Environment and standards</b>							
Ambient temperature <sup>4)</sup>	°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					

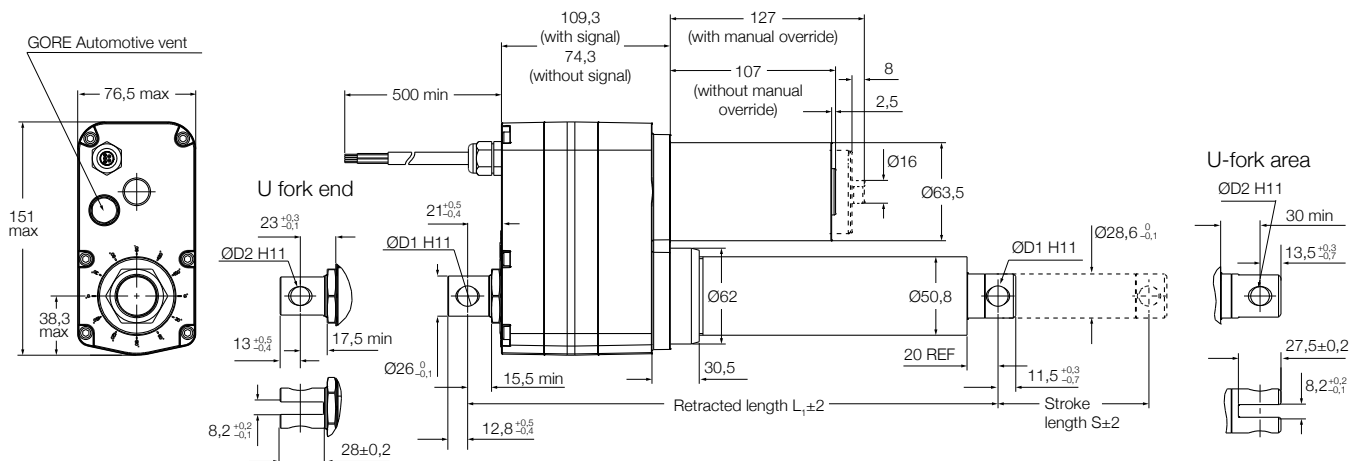
<sup>1)</sup> Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits

<sup>2)</sup> Ultimate Static Load, refer to the “Static load” diagrams

<sup>3)</sup> The data of speed and current on this list is defined at +20 °C

<sup>4)</sup> Full performance from 0 °C to +40 °C

## 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
L <sub>1</sub> retracted length no option	160 + stroke	211 + stroke
L <sub>1</sub> retracted length with signal	195 + stroke	246 + stroke

## Technical data

Designation	Unit	CAHB-20E / 48 V		
<b>Performance data</b>				
Rated Push Force	N	1 500	2 500	4 500
Rated Pull Force	N	1 500	2 500	4 500
Max pull / push Force <sup>1)</sup>	N	2 600	3 800	6 300
Holding force <sup>2)</sup>	N			
Speed without load <sup>3)</sup>	mm/s	31,0	23,0	13,0
Speed with the rated force <sup>3)</sup>	mm/s	27,5	20,0	11,0
<b>Electric data</b>				
Nominal voltage	V DC	48	48	48
Nominal current @ rated load <sup>3)</sup>	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)
<b>Mechanical data</b>				
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
<b>Environment and standards</b>				
Ambient temperature <sup>4)</sup>	°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		

<sup>1)</sup> 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

<sup>2)</sup> Ultimate Static Load, refer to the "Static load" diagrams

<sup>3)</sup> The data of speed and current on this list is defined at +20 °C

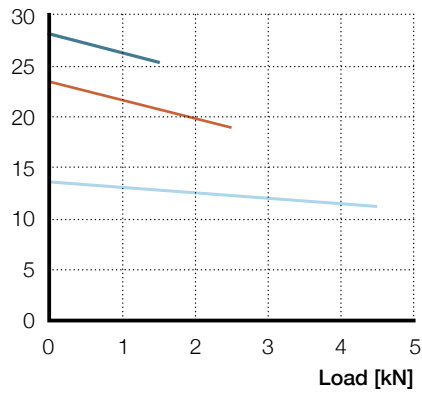
<sup>4)</sup> Full performance from 0 °C to +40 °C



## Performance diagrams

Speed-load diagram

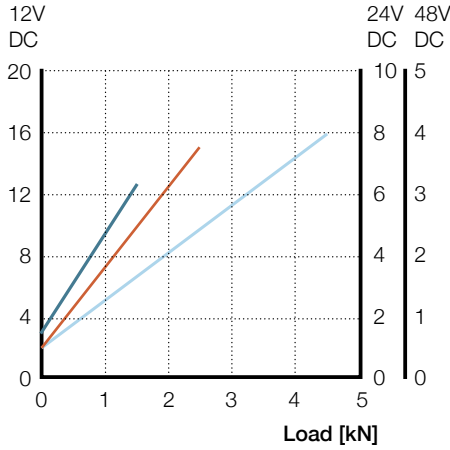
Speed [mm/s]



- Rated push force 1 500
- Rated push force 2 500
- Rated push force 4 500

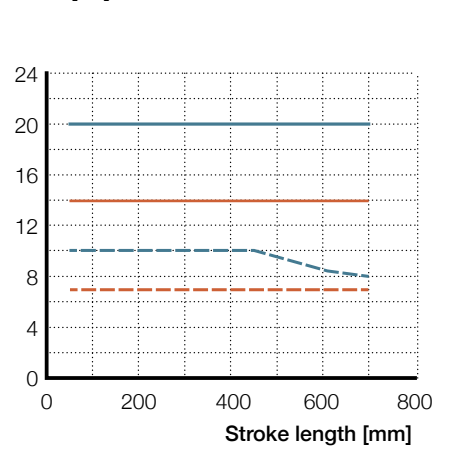
Current load diagram

Current consumption [A]



Static load diagram

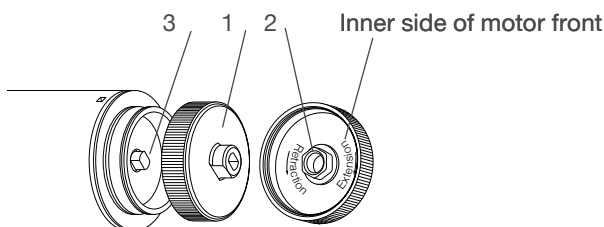
Load [kN]



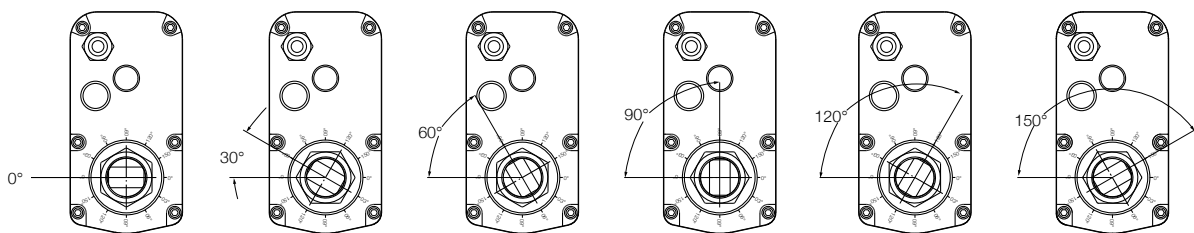
- Ultimate CAHB-20-xxE (pull)
- - - Ultimate CAHB-20-xxE (push)
- Recommended CAHB 20-xxE (pull)
- - - Recommended CAHB 20-xxE (push)

## Manual override

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



## Attachment



## Electrical specifications

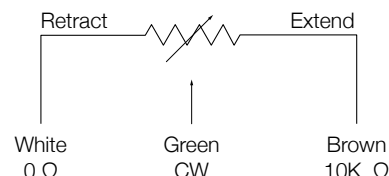
### Wire connection with no signal

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

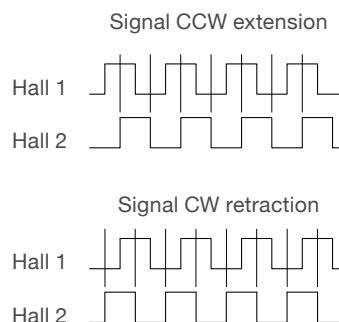
### Potentiometer



### 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

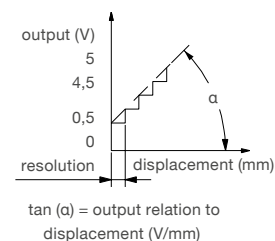


### Wire connection with absolute analog output

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

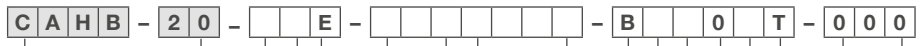
Input voltage: 10~55 V DC  
 Current consumption: 15 mA max.  
 Output analog signal (voltage): 0~5 V DC  
 Max current output: 5 mA  
 Absolute analog output set up:  
 retraction 0,5±0,15 V  
 extension 4,5 to the maximum



### 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	0,0148 if S=126-250	0,0827 if S=126-250
		9,84 if S=251-700	0,0049 if S=251-700	0,2480 if S=251-700

Ordering key



Type

Voltage

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

Load

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

Design

E

Stroke

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

Retracted length<sup>1)</sup>

Stroke	without position output	with position output
100 mm	260	295
150 mm	310	345
200 mm	360	395
250 mm	410	445
300 mm	460	495
350 mm	561	596
400 mm	611	646
450 mm	661	696
500 mm	711	746
600 mm	811	846
700 mm	911	946

Ingress protection

B Standard: IP69K/IP66M

Attachment diameter: (Front and rear)

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

Attachment orientation

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

Option 1: Limit switch

0 Not available

Option 2: Position output

- 0 None
- A Absolute analog output
- P Potentiometer
- E Encoder

Thermal protection

T Standard: Built-in thermal switch

Customization

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

<sup>1)</sup> 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		
<b>Performance data</b>							
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 <sup>1)</sup>	N	2 500	3 600	6 300	2 500	3 600	6 300
Holding force <sup>2)</sup>	N						
Speed without load <sup>3)</sup>	mm/s	49,5	37	24,0	52,5	38	22,5
Speed with the rated force <sup>3)</sup>	mm/s	43	31,5	19,0	50	31,5	21,0
<b>Electric data</b>							
Nominal voltage	V DC	12	12	12	24	24	24
Nominal current @ rated load <sup>3)</sup>	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)
<b>Mechanical data</b>							
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
<b>Environment and standards</b>							
Ambient temperature <sup>4)</sup>	°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					

<sup>1)</sup> 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

<sup>2)</sup> Ultimate Static Load, refer to the “Static load” diagrams

<sup>3)</sup> The data of speed and current on this list is defined at +20 °C

<sup>4)</sup> Full performance from 0 °C to +40 °C

## Technical data

Designation	Unit	CAHB-21E / 48 V		
<b>Performance data</b>				
Rated Push Force	N	1 500	2 500	4 500
Rated Pull Force	N	1 500	2 500	4 500
Max pull / push Force <sup>1)</sup>	N	2 500	3 600	6 300
Holding force <sup>2)</sup>	N			
Speed without load <sup>3)</sup>	mm/s	51,5	41,0	23,5
Speed with the rated force <sup>3)</sup>	mm/s	46,0	33,5	19,0
<b>Electric data</b>				
Nominal voltage	V DC	48	48	48
Nominal current @ rated load <sup>3)</sup>	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)
<b>Mechanical data</b>				
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
<b>Environment and standards</b>				
Ambient temperature <sup>4)</sup>	°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		

<sup>1)</sup> 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

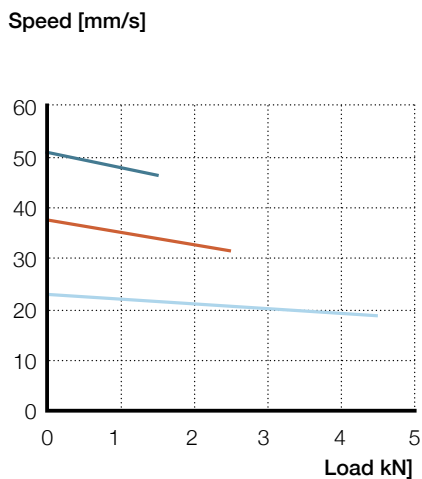
<sup>2)</sup> Ultimate Static Load, refer to the "Static load" diagrams

<sup>3)</sup> The data of speed and current on this list is defined at +20 °C

<sup>4)</sup> Full performance from 0 °C to +40 °C

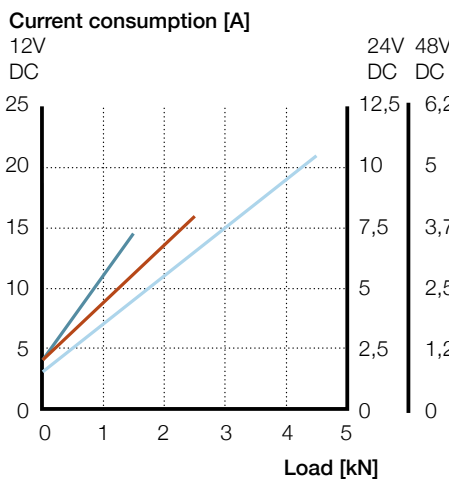
## Performance diagrams

Speed-load diagram

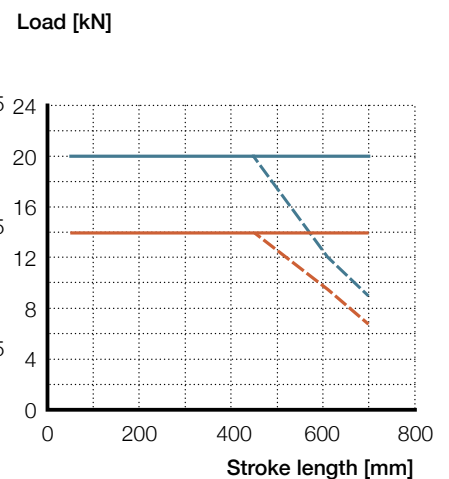


- Rated push force 1 500
- Rated push force 2 500
- Rated push force 4 500

Current load diagram

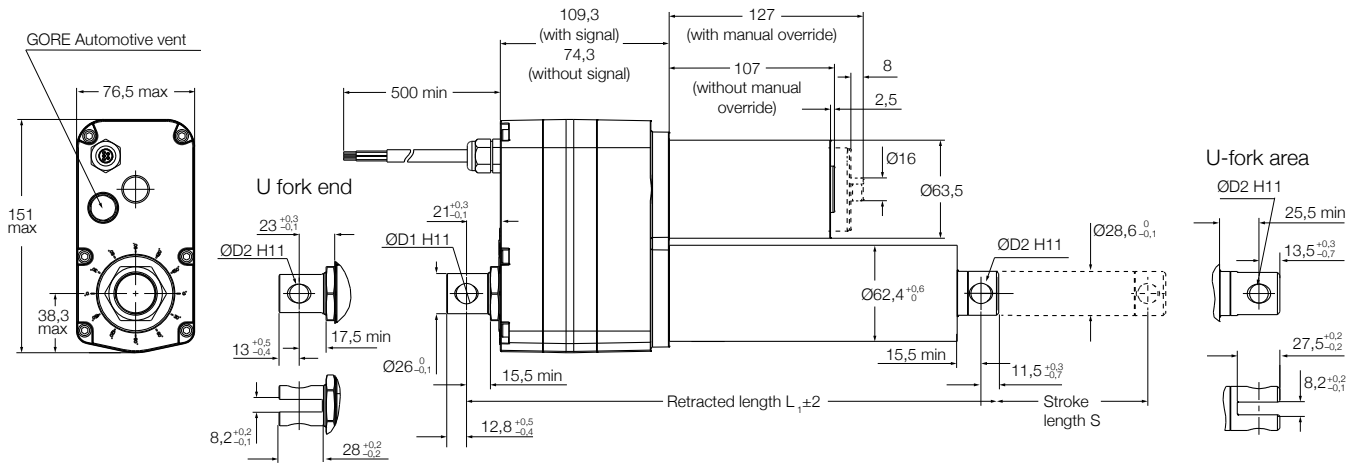


Static load diagram



- Ultimate CAHB-21-xxE (pull)
- - - Ultimate CAHB-21-xxE (push)
- Recommended CAHB 21-xxE (pull)
- - - Recommended CAHB 21-xxE (push)

### 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 <sub>r</sub> retracted length no option	182 + stroke	217 + stroke	194 + stroke	229 + stroke
L <sub>r</sub> retracted length with LS	191 + stroke	226 + stroke	203 + stroke	238 + stroke
L <sub>r</sub> retracted length with signal	217 + stroke	252 + stroke	229 + stroke	264 + stroke
L <sub>r</sub> retracted length with LS and signal	226 + stroke	261 + stroke	238 + stroke	273 + stroke

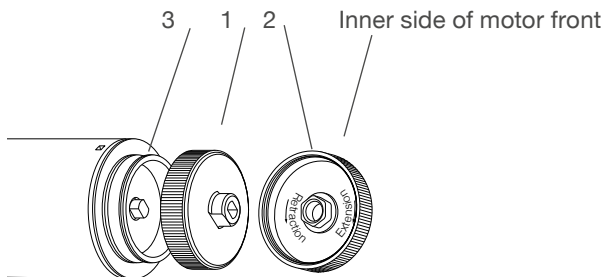
Tolerance of stroke "S"

Without LS: if S ≤ 305 (±2); if S > 305 (±3)

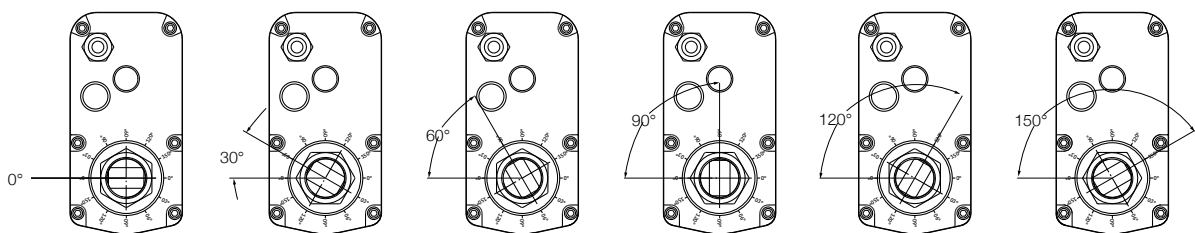
With LS: if S ≤ 305 (-2, -0,5); if S > 305 (-3, -1)

### Manual override

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



### Attachment



## Electrical specifications

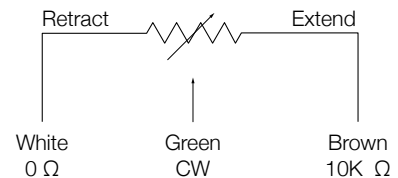
### Wire connection with no signal

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

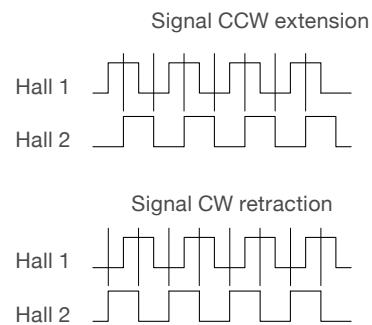
### Potentiometer



### 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

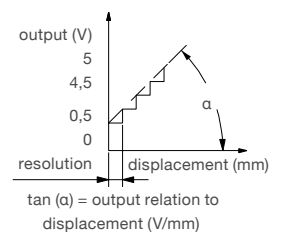


### Wire connection with absolute analog output

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 consumption: 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**
- A 12 V DC
  - B 24 V DC
  - D 48 V DC
  - E 12 V DC with manual override
  - F 24 V DC with manual override
  - H 48 V DC with manual override

- Load**
- 1 1 500 N
  - 2 2 500 N
  - 3 4 500 N

- Design**
- E

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

**Retracted length<sup>1)</sup>**

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**
- B Standard: IP69K/IP66M

- Attachment diameter: (Front and rear)**
- A Hole Ø13,1 H11 (+0, +0,11 mm)
  - B Hole Ø12,8 H11 (0, +0,11 mm)
  - C Hole Ø12,5 H11 (+0, +0,11mm)
  - D Hole Ø14 H11(+0,+0,11mm)
  - E Hole 12.2 H11(+0,+0,11mm)
  - F U fork hole 12,2 H11
  - G U fork hole 12,8 H11
  - X Customized

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

- Option 1: Limit switch**
- 0 None (mandatory for 1 500 N, 2 500 N version)
  - L Limit switch (valid only for load version 4 500 N)

- Option 2: Position output**
- 0 None
  - A Absolute analog output
  - P Potentiometer
  - E Encoder

- Thermal protection**
- T Standard: Built-in thermal switch

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

<sup>1)</sup> 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			
<b>Performance data</b>									
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 <sup>1)</sup>	N	3 500	4 900	9 500	14 000	3 500	4 900	9 500	14 000
Holding force <sup>2)</sup>	N								
Speed without load <sup>3)</sup>	mm/s	55,0	45,0	22,0	13,0	53,0	45,0	22,0	13,0
Speed with the rated force <sup>3)</sup>	mm/s	42,0	36,0	15,5	10,2	42,0	37,0	17,0	10,2
<b>Electric data</b>									
Nominal voltage	V DC	12	12	12	12	24	24	24	24
Nominal current @ rated load <sup>3)</sup>	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)
<b>Mechanical data</b>									
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
<b>Environment and standards</b>									
Ambient temperature <sup>4)</sup>	°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							

<sup>1)</sup> 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

<sup>2)</sup> Ultimate Static Load, refer to the "Static load" diagrams

<sup>3)</sup> The data of speed and current on this list is defined at +20 °C

<sup>4)</sup> Full performance from 0 °C to +40 °C

## Technical data

Designation	Unit	CAHB-22E / 48 V			
<b>Performance data</b>					
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 <sup>1)</sup>	N	3 500	4 900	9 500	14 000
Holding force <sup>2)</sup>	N				
Speed without load <sup>3)</sup>	mm/s	57,0	45,0	22,0	13,0
Speed with the rated force <sup>3)</sup>	mm/s	50,0	37,0	18,5	10,2
<b>Electric data</b>					
Nominal voltage	V DC	48	48	48	48
Nominal current @ rated load <sup>3)</sup>	A	4,5	5	5	4,3
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)
<b>Mechanical data</b>					
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
<b>Environment and standards</b>					
Ambient temperature <sup>4)</sup>	°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			

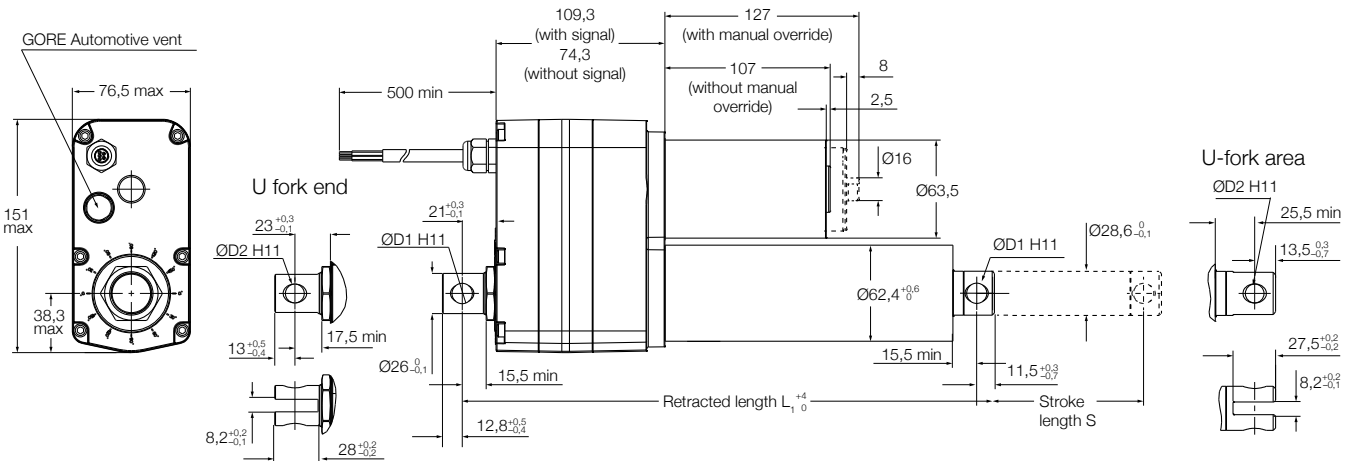
<sup>1)</sup> Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits

<sup>2)</sup> Ultimate Static Load, refer to the "Static load" diagrams

<sup>3)</sup> The data of speed and current on this list is defined at +20 °C

<sup>4)</sup> Full performance from 0 °C to +40 °C

## 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
L <sub>1</sub> retracted length no option	194 + stroke	229 + stroke	206 + stroke
L <sub>1</sub> retracted length with LS	200 + stroke	235 + stroke	212 + stroke
L <sub>1</sub> retracted length with signal	229 + stroke	264 + stroke	241 + stroke
L <sub>1</sub> retracted length with LS and signal	235 + stroke	270 + stroke	247 + stroke

Tolerance of stroke "S"

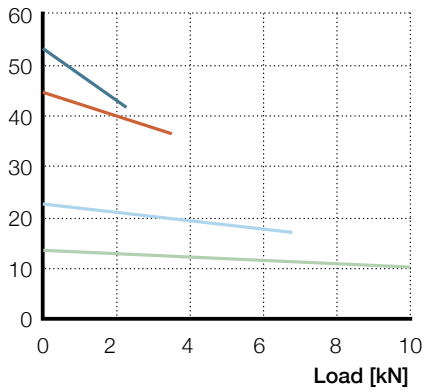
Without LS: for CAHB22-1E/2E if S ≤ 305 (-3, -1,5); if S > 305 (-4, -2) for CAHB22-3E/4E if S ≤ 305 (-2, -0,5); if S > 305 (-3, -1)

With LS: if S ≤ 305 (±2); if S > 305 (±3)

## Performance diagrams

Speed-load diagram

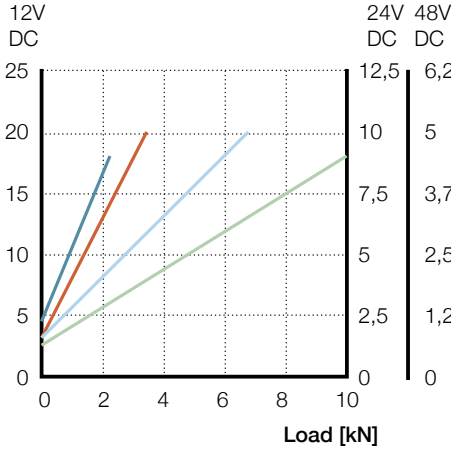
Speed [mm/s]



- Rated push force 2 300
- Rated push force 3 500
- Rated push force 6 800
- Rated push force 10 000

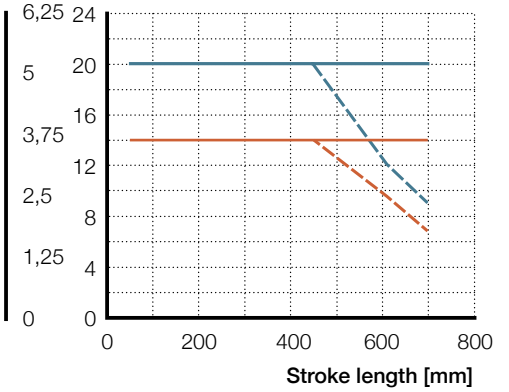
Current load diagram

Current consumption [A]



Static load diagram

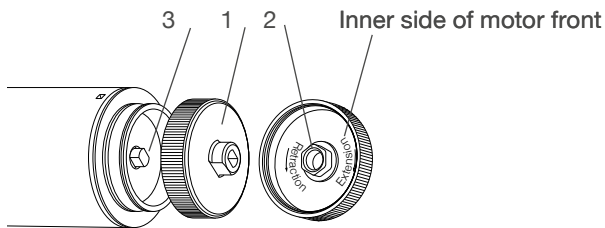
Load [kN]



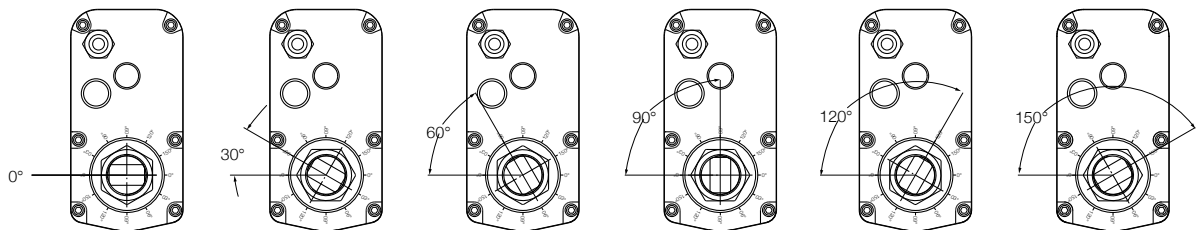
- Ultimate CAHB-22-xxE (pull)
- - - Ultimate CAHB-22-xxE (push)
- Recommended CAHB 22-xxE (pull)
- - - Recommended CAHB 22-xxE (push)

## 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

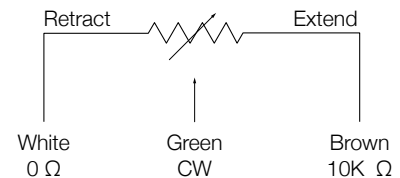
### Wire connection with encoder

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

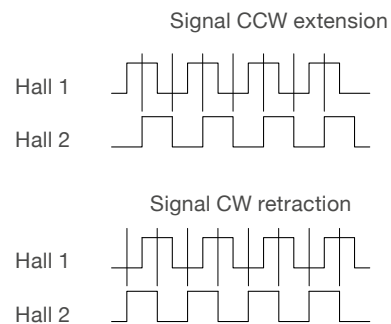
### Wire connection with absolute analog output

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



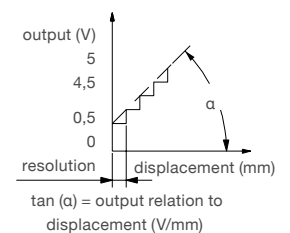
### Encoder



### Absolute analog position output

Input voltage: 10~55 V DC  
 Current consumption: 15 mA max.  
 Output analog signal (voltage): 0~5 V DC  
 Max current output: 5 mA

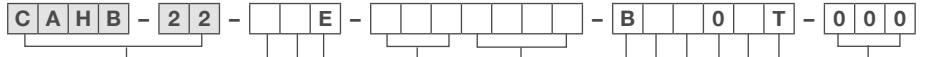
Absolute analog output set up:  
 retraction 0,5±0,15 V  
 extension 4,5 to the maximum



### 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	0,1628 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=050-127	0,030 if S=050-127	0,0407 if S=050-127
CAHB-22...4E	2,8	30 if S=128-254	0,015 if S=128-254	0,0814 if S=128-254
		10 if S=255-700	0,005 if S=255-700	0,2441 if S=255-700

Ordering key



Type

Voltage

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

Load

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

Design

E

Stroke

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

Retracted length<sup>1)</sup>

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

B Standard: IP69K/IP66M

Attachment diameter: (Front and rear)

- A Hole Ø13,1 H11 (+0, +0,11 mm)
- B Hole Ø12,8 H11 (0, +0,11 mm)
- C Hole Ø12,5 H11 (+0, +0,11 mm)
- D Hole Ø14 H11(+0, +0,11mm)
- E Hole Ø12,2 H11(+0,+0,11mm)
- F U fork hole 12,2 H11
- G U fork hole 12,8 H11
- X Customized

Attachment orientation

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

Option 1: Limit switch

- 0 None (mandatory for 2 300 N and 3 500 N version)
- L Limit switch (valid only for load version 6 800 N and 10 000 N)

Option 2: Position output

- 0 None
- A Absolute analog output
- P Potentiometer
- E Encoder

Thermal protection

T Standard: Built-in thermal switch

Customization

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

<sup>1)</sup> 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.