

Linear actuator CAHB series





CAHB series

Designed to operate in harsh environment with temperatures from -40 to $85\text{ }^{\circ}\text{C}$ 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 overload 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 $85\text{ }^{\circ}\text{C}$)
- 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

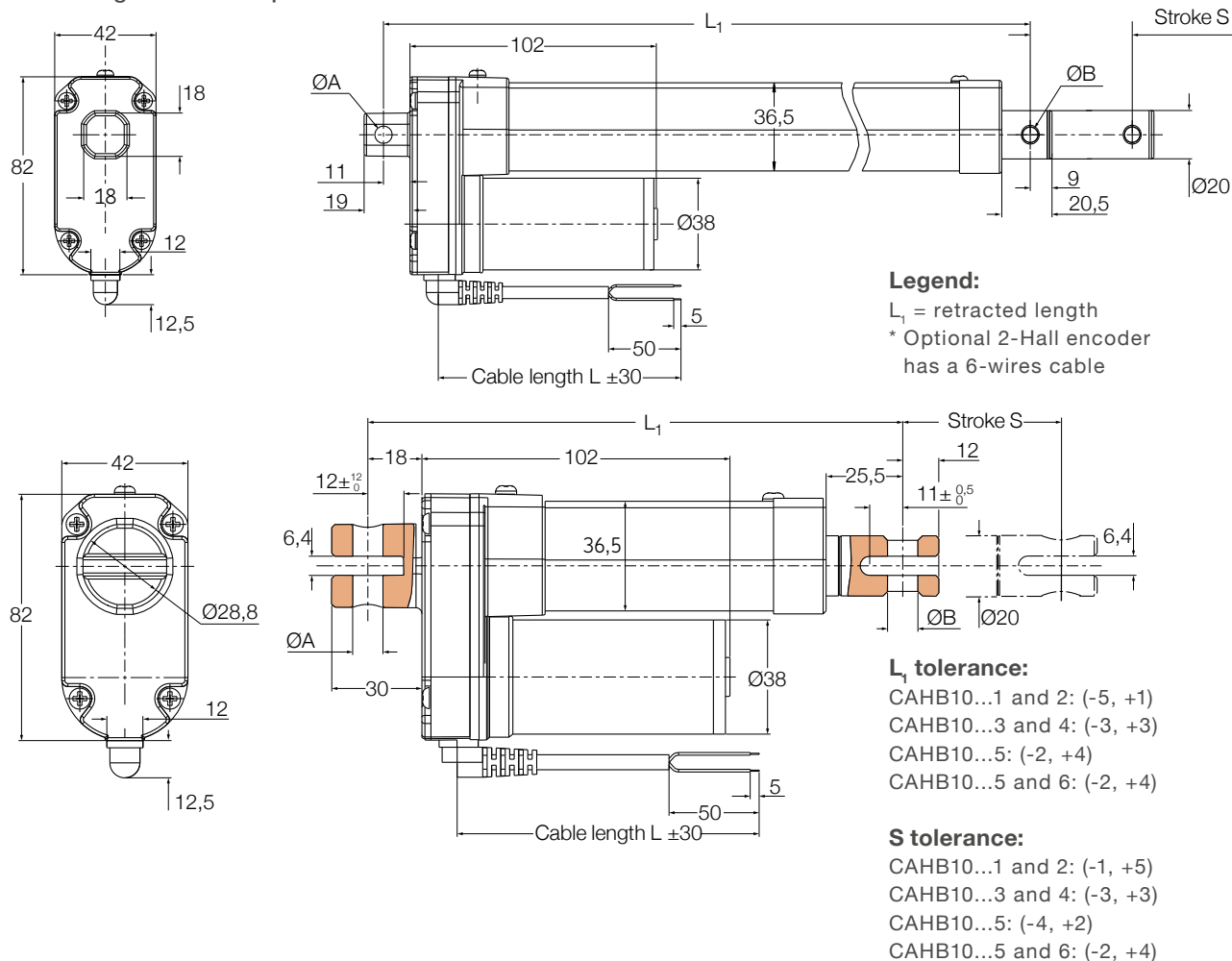
Designation	Unit	CAHB-10... 1	CAHB-10... 2	CAHB-10... 3	CAHB-10... 4	CAHB-10... 5	CAHB-10... 6
Push load	N	120	240	500	750	1 000	1 500
Pull load	N	120	240	500	750	1 000	1 500
Speed (full load to no load)	mm/s	45 to 56	24 to 30	13 to 16	8 to 10	6 to 8	5 to 8
Stroke	mm	50 to 300	50 to 300	50 to 300	50 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

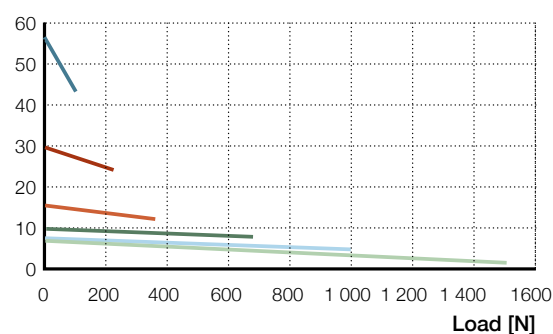


Stroke [mm]	50	100	150	200	250	300
Retracted length (L_1)	158	209	260	311	362	413
Retracted length with fork head	179	230	281	332	383	434

Performance diagrams

Speed-load diagram

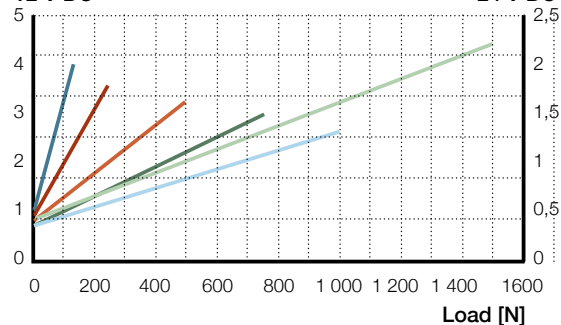
Speed [mm/s]



Current-load diagram

Current consumption [A]

12 V DC



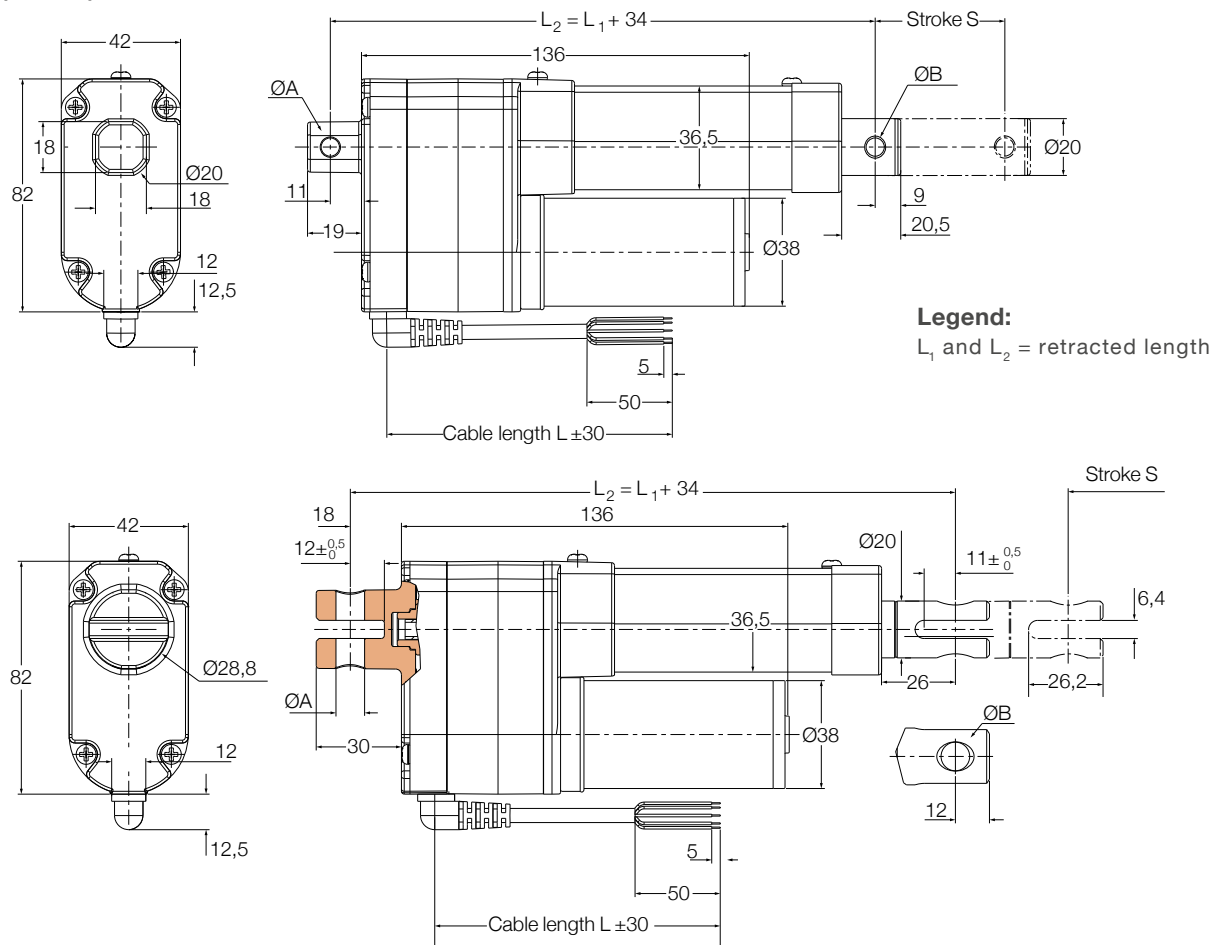
— CAHB-10...1
 — CAHB-10...2

— CAHB-10...3
 — CAHB-10...4

— CAHB-10...5
 — CAHB-10...6

Dimensional drawing

Optional potentiometer



L₂ tolerance:

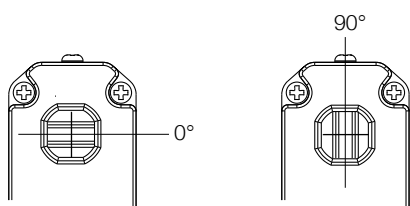
CAHB10...1 and 2: (-5, +1)
CAHB10...3 and 4: (-3, +3)
CAHB10...5: (-2, +4)
CAHB10...5 and 6: (-2, +4)

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

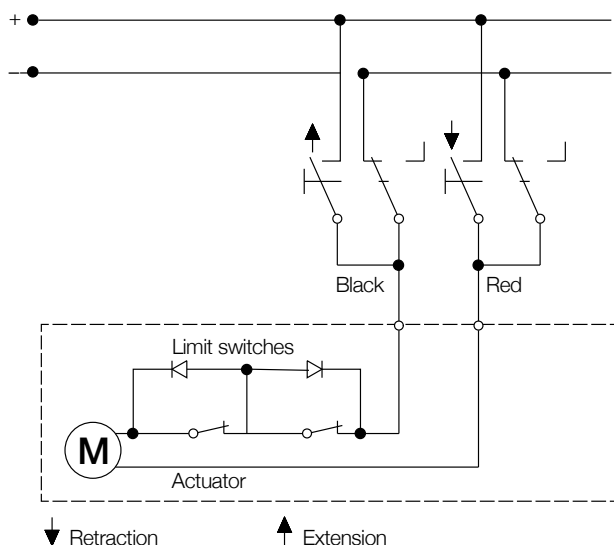
Stroke [mm]	50~80	80~160	160~300
Minimum resistance value of potentiometer	700~1 300 Ω	700~1 300 Ω	700~1 300 Ω
Potentiometer resolution	100 Ω /mm	50 Ω /mm	16,6 Ω /mm

Absolute analog output

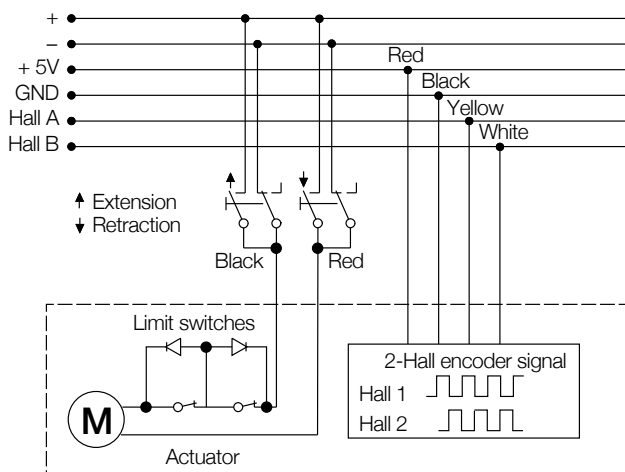
Stroke [mm]	50~80	80~160	160~300
Initial value VS RL position (V)	0,5	0,5	0,5
Resolution (mm)	0,024	0,049	0,0146
Position feedback change (V/mm)	0,05	0,025	0,0083

Connecting diagram

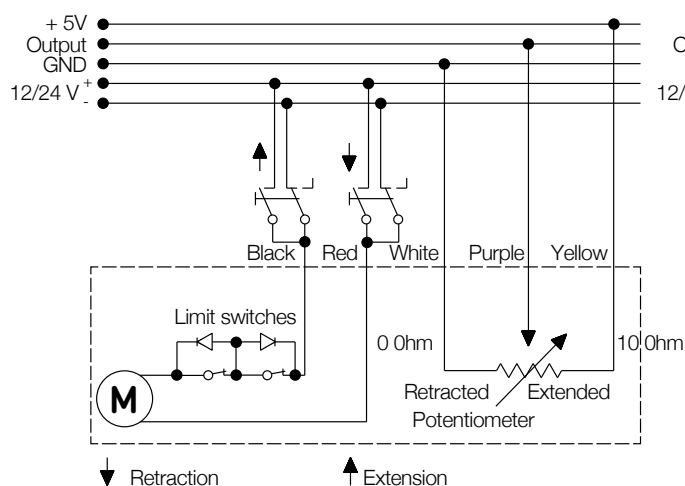
Basic configuration 12/24 V DC



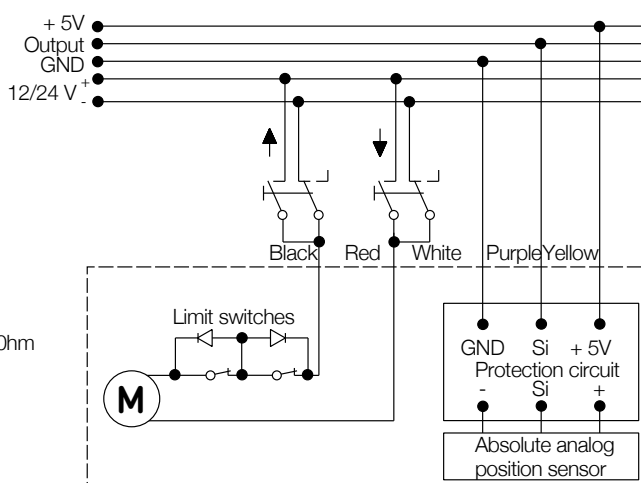
2-Hall encoder 12/24 V DC



Potentiometer



Absolute analog output



C	A	H	B	-	1	0	-			-					-	A				-	0	0	0
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[illegible]

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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)



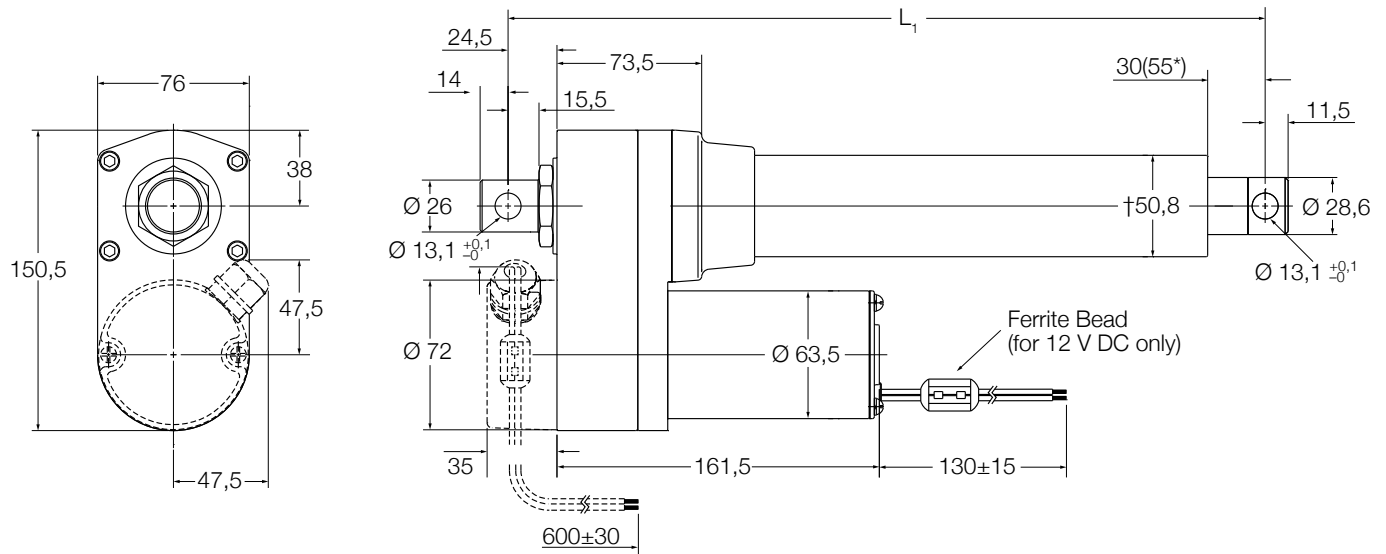
Technical data

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 switch:

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

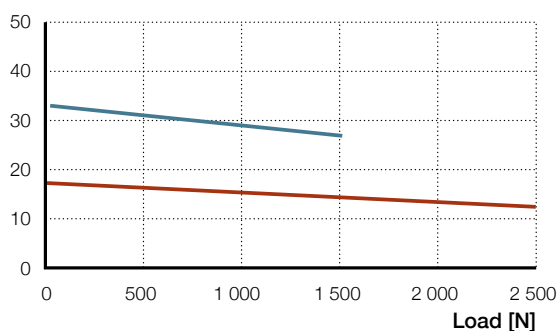
¹⁾ Tolerance: S and $L_1 = \pm 5,0$ mm (if $S \geq 305$ mm, $S = \pm 7,5$ mm)

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

Performance diagrams

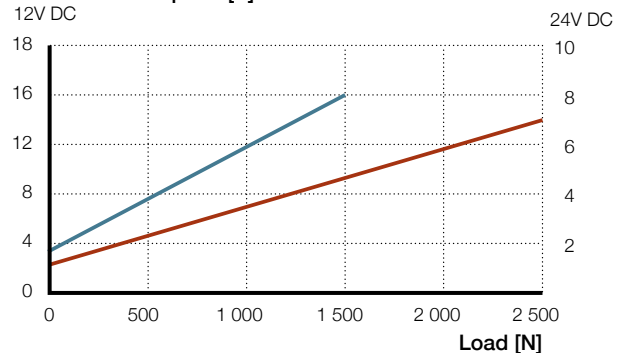
Speed-load diagram

Speed [mm/s]



Current-load diagram

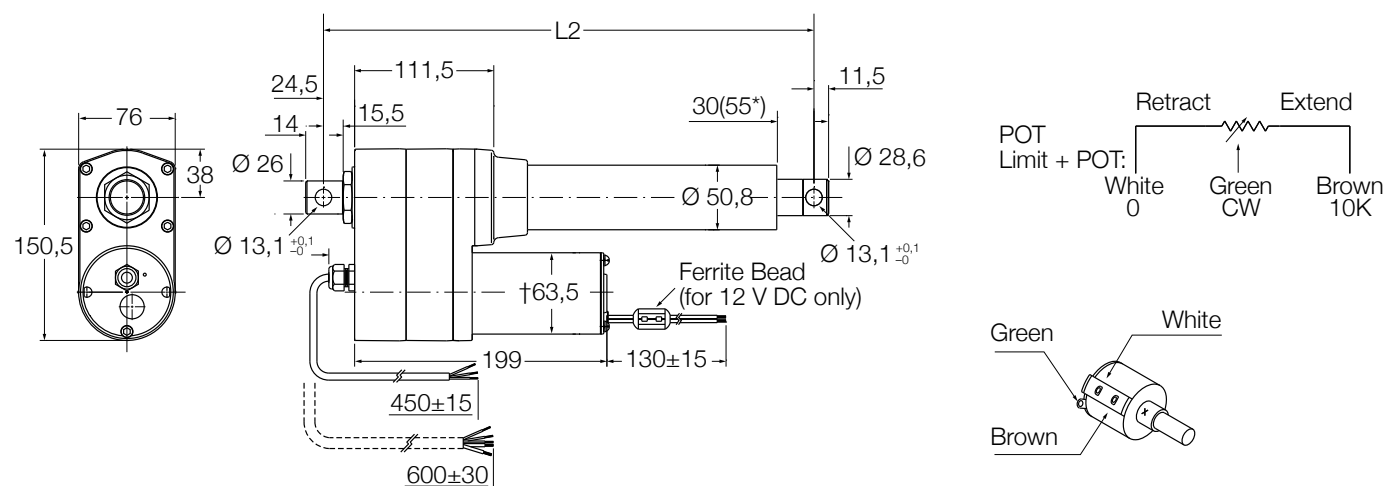
Current consumption [A]



— 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

*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 _r Retracted length	376	427	478	630	782	935	300	351	402	503	706	859

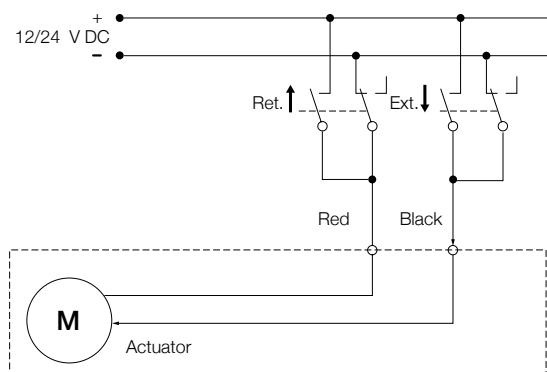
¹⁾ Tolerance: S and L1 = $\pm 5,0$ mm (If S ≥ 305 mm, S = $\pm 7,5$ mm)

²⁾ Tolerance: S = $\pm 2,5$ mm and L2 = $\pm 3,8$ mm

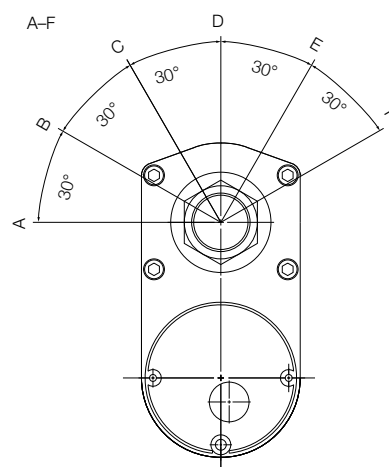
Potentiometer resolution

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

		C A H B - 2 0 -				A -				- A				- 0 0 0			
Type																	
Voltage																	
12 V DC		A															
24 V DC		B															
Load																	
1 500 N		1															
2 500 N		2															
Design																	
Stroke																	
102 mm		102															
153 mm		153															
204 mm		204															
305 mm		305															
457 mm		457															
610 mm		610															
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																	
Standard: IP66		A															
Front attachment																	
Standard (Standard (hole: Ø13,1 mm)		A															
Customized		X															
Rear attachment																	
Standard (0° and hole: Ø13,1 mm)		A															
30°		B															
60°		C															
90°		D															
120°		E															
150°		F															
Customized		X															
Option 1																	
None		O															
Limit switch (only for load version 2 500 N)		L															
Option 2																	
None		O															
Potentiometer		T															
Option 3																	
None		O															
Thermal protection		T															
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



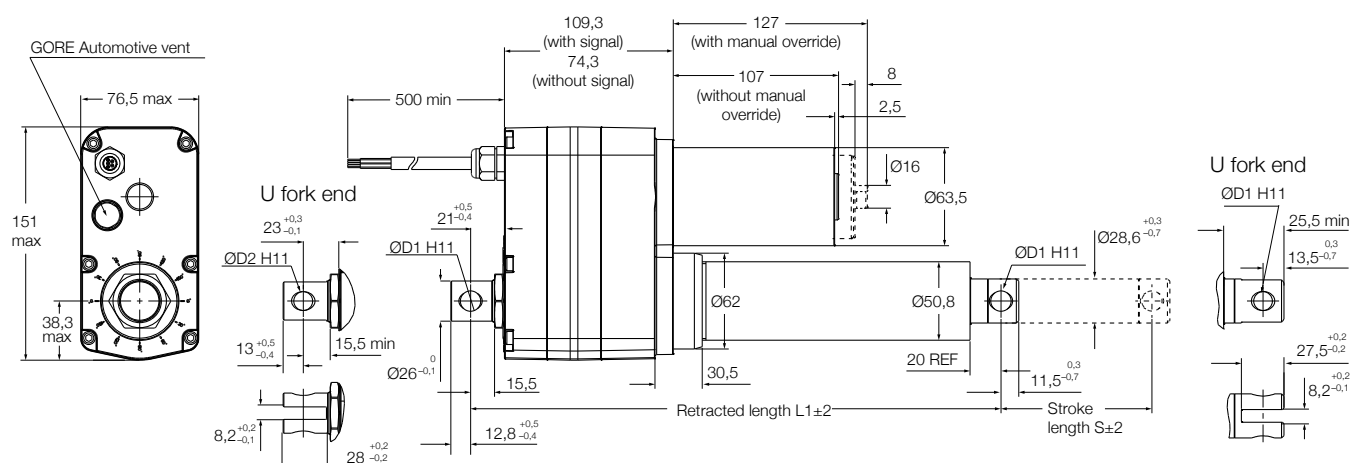
Technical data

Designation	Unit	CAHB-20E / 12 V			CAHB-20E / 24 V		
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		

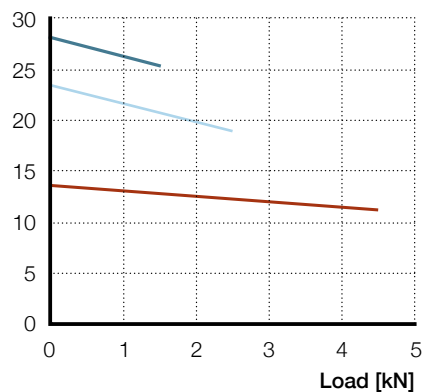
¹⁾ Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits

2) Ultimate Static Load, refer to the "Static load" diagrams

Performance diagrams

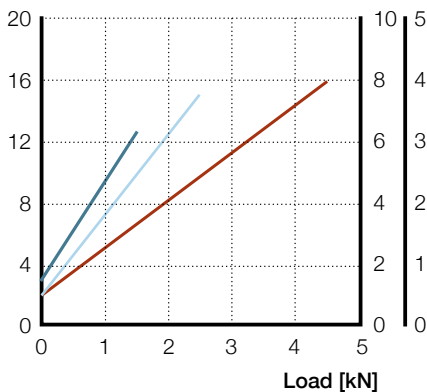
Speed-load diagram

Speed [mm/s]



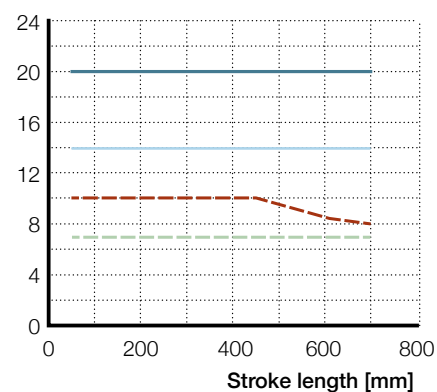
Current load diagram

Current consumption [A]



Static load diagram

Load [kN]



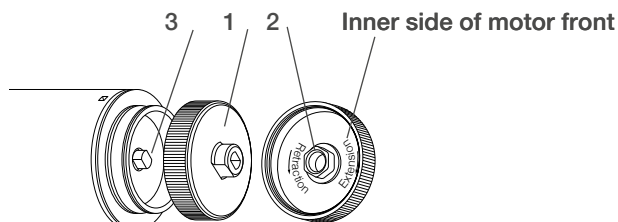
- Rated push force 1 500
- Rated push force 2 500
- Rated push force 4 500

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

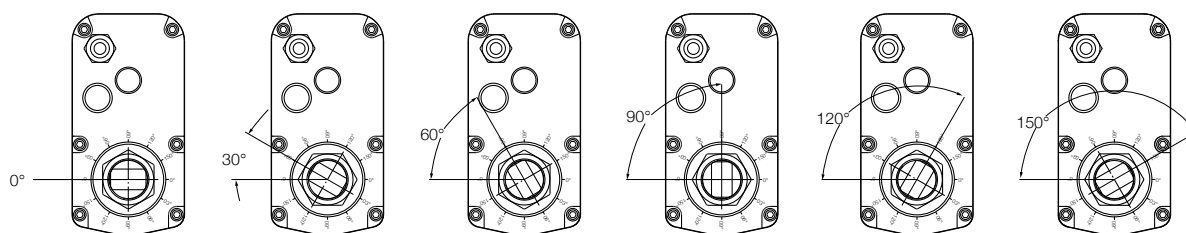
- Recommended CAHB 20-xxE (push)
- Recommended CAHB 20-xxE (pull)

Manual override

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



Attachment



Electrical specifications

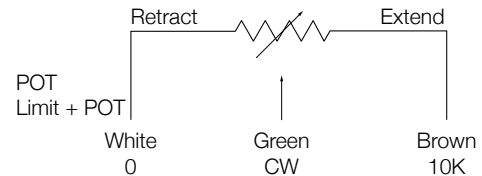
Wire connection with no signal

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

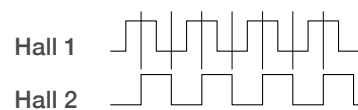


Wire connection with encoder

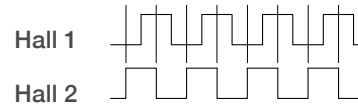
Wire no.	AWG	Colour	Application
1	26	Green	Sensor signal 1 Encoder
2	26	Yellow	Sensor signal 2 Encoder
3	26	Black	Sensor power GND Encoder
4	26	Red	Sensor power 5 V Encoder
5	14	Red	Motor power(+)=> Extension, (-)=> Retraction
6	14	Black	Motor power(-)=> Extension, (+)=> Retraction

Encoder

Signal CCW extension



Signal CW retraction

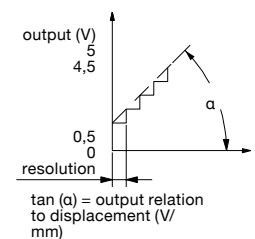


Wire connection with absolute analog output

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

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	0,0295 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

C A H B - 2 0 -		E -		B 0 T - 0 0 0	
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	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					
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					
Not available				0	
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-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		

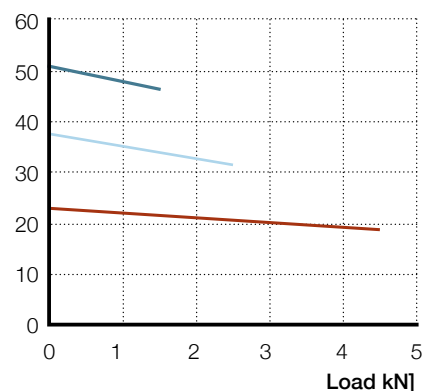
¹⁾ Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits

²⁾ Ultimate Static Load, refer to the "Static load" diagrams

Performance diagrams

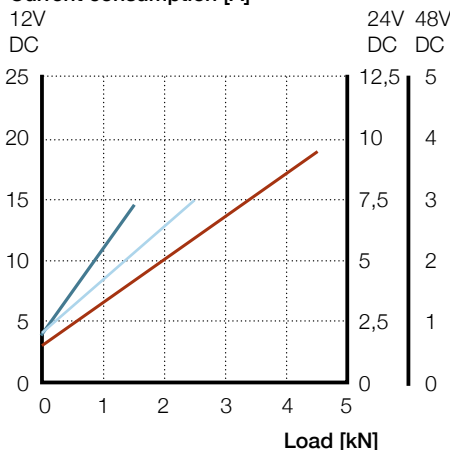
Speed-load diagram

Speed [mm/s]



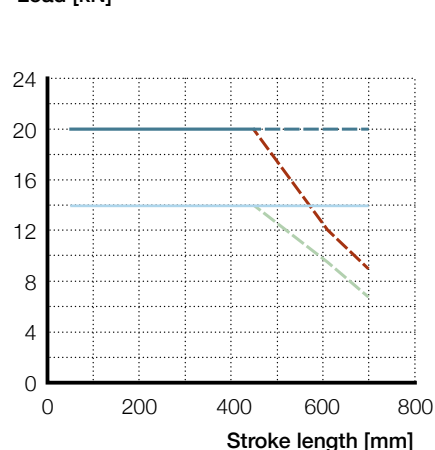
Current load diagram

Current consumption [A]



Static load diagram

Load [kN]

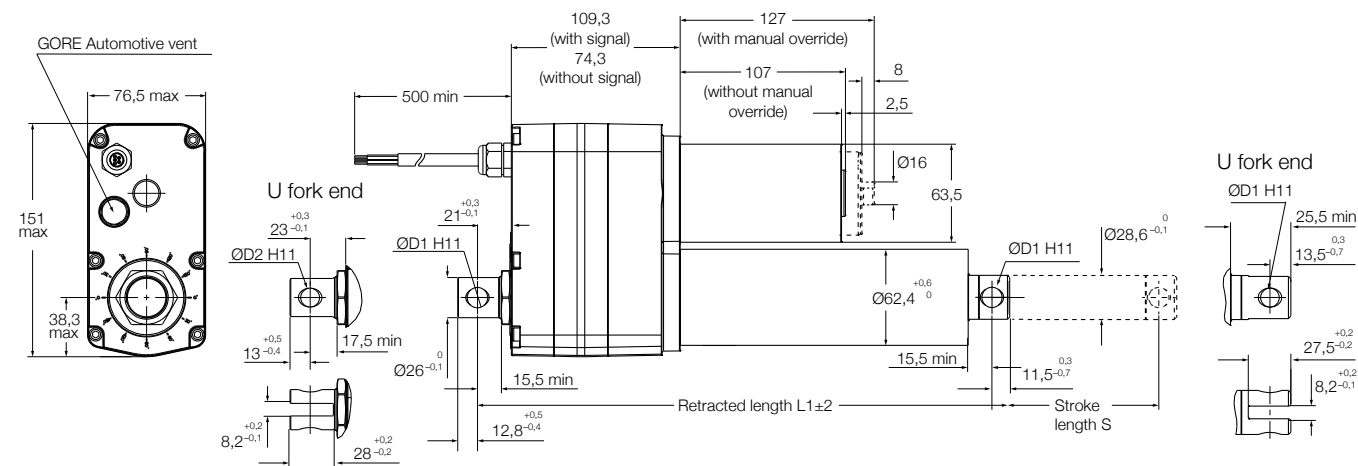


— Rated push force 1 500
— Rated push force 2 500
— Rated push force 4 500

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

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

Dimensional drawing

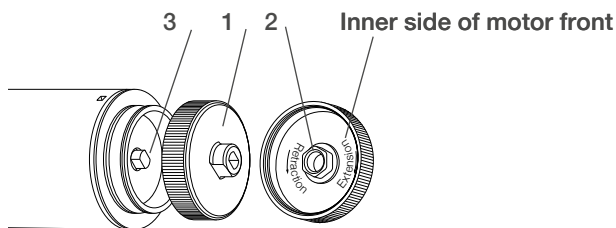


Rod end attachment (D1)					U fork attachment (D2)		
Holes symbol	A	B	C	D	E	F	G
Hole dimension	13,1	12,8	12,5	14	12,2	12,2	12,8

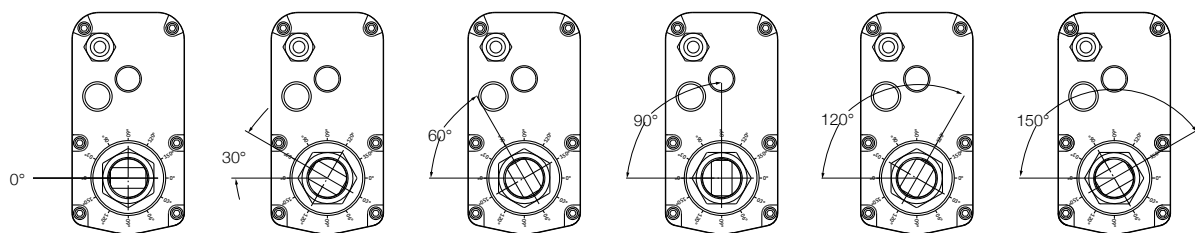
	Rod end attachment		U fork attachment	
S Stroke [mm]	50-305	306-700	50-305	306-700
L _r retracted length no option	182 + stroke	217 + stroke	194 + stroke	229 + stroke
L _r retracted length with LS	191 + stroke	226 + stroke	203 + stroke	238 + stroke
L _r retracted length with signal	217 + stroke	252 +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

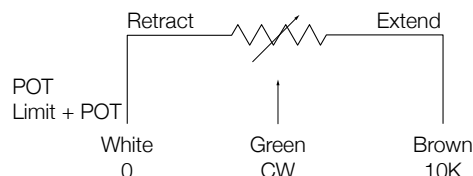
Wire connection with no signal

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

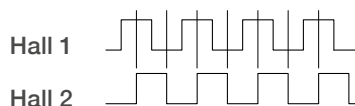


Wire connection with encoder

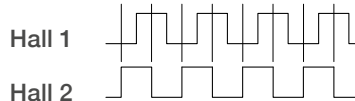
Wire no.	AWG	Colour	Application
1	26	Green	Sensor signal 1 Encoder
2	26	Yellow	Sensor signal 2 Encoder
3	26	Black	Sensor power GND Encoder
4	26	Red	Sensor power 5 V Encoder
5	14	Red	Motor power(+)=> Extension, (-)> Retraction
6	14	Black	Motor power(-)> Extension, (+)> Retraction

Encoder

Signal CCW extension



Signal CW retraction

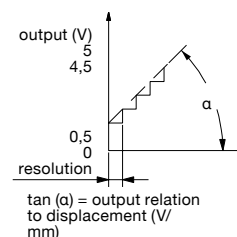


Wire connection with absolute analog output

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

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	C	A	H	B	-	2	1	-		E	-							B				T	-	0	0	0
Voltage																										
12 V DC																										
24 V DC																										
48 V DC																										
12 V DC with manual override																										
24 V DC with manual override																										
48 V DC with manual override																										
Load																										
1 500 N																										
2 500 N																										
4 500 N																										
Design																										
Stroke																										
100 mm																										
150 mm																										
200 mm																										
250 mm																										
300 mm																										
350 mm																										
400 mm																										
450 mm																										
500 mm																										
600 mm																										
700 mm																										
Retracted length ¹⁾																										
Stroke																										
100 mm																										
150 mm																										
200 mm																										
250 mm																										
300 mm																										
350 mm																										
400 mm																										
450 mm																										
500 mm																										
600 mm																										
700 mm																										
with limit switch																										
without position output																										
with position output																										
100 mm																										
150 mm																										
200 mm																										
250 mm																										
300 mm																										
350 mm																										
400 mm																										
450 mm																										
500 mm																										
600 mm																										
700 mm																										
without limit switch																										
100 mm																										
150 mm																										
200 mm																										
250 mm																										
300 mm																										
350 mm																										
400 mm																										
450 mm																										
500 mm																										
600 mm																										
700 mm																										
Ingress protection																										
Standard: IP69K/IP66M																										
Attachment diameter: (Front and rear)																										
Hole Ø13,1 H11 (+0, +0,11 mm)																										
Hole Ø12,8 H11 (0, +0,11 mm)																										
Hole Ø12,5 H11 (+0, +0,11mm)																										
Hole Ø14 H11(+0,+0,11mm)																										
Hole 12.2 H11(+0,+0,11mm)																										
U fork hole 12.2 H11																										
U fork hole 12.8 H11																										
Customized																										
Attachment orientation																										
Standard (0°)																										
30°																										
60°																										
90°																										
120°																										
150°																										
Customized																										
Option 1: Limit switch																										
None (mandatory for 1 500 N, 2 500 N version and the 48 VDC version)																										
Limit switch (valid only for load version 4 500 in 12 or 24 V DC)																										
Option 2: Position output																										
None																										
Absolute analog output																										
Potentiometer																										
Encoder																										
Thermal protection																										
Standard: Built-in thermal switch																										
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							

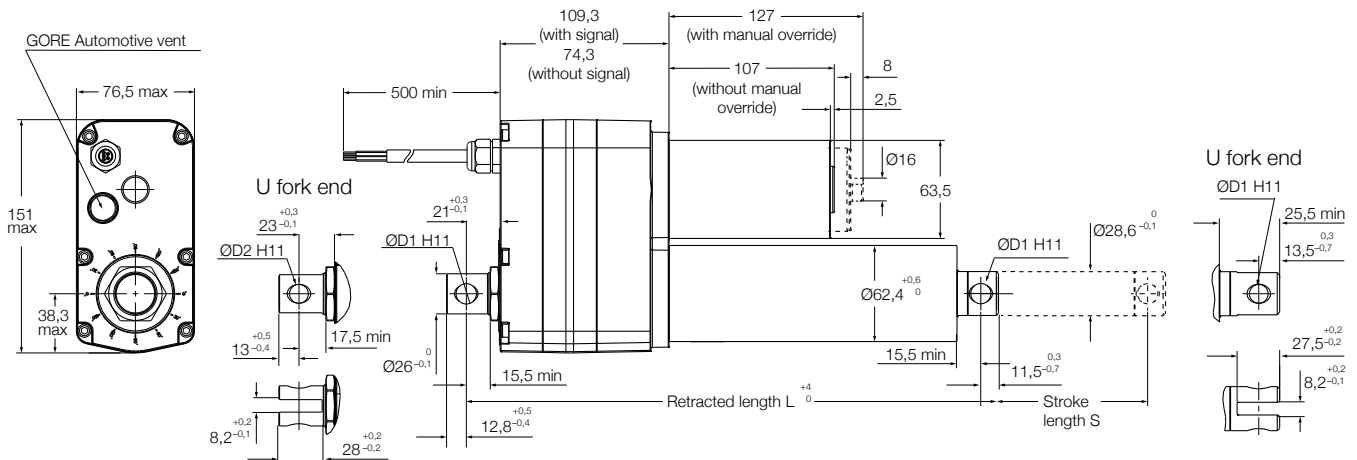
¹⁾ Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits

²⁾ Ultimate Static Load, refer to the "Static load" diagrams

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			

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 _r retracted length no option	194 + stroke	229 + stroke	206 + stroke	241 + stroke
L _r retracted length with LS	200 + stroke	235 + stroke	212 + stroke	247 + stroke
L _r retracted length with signal	229 + stroke	264 + stroke	241 + stroke	276 + stroke
L _r retracted length with LS and signal	235 + stroke	270 + stroke	247 + stroke	282 + stroke

Tolerance L_r: Stroke S

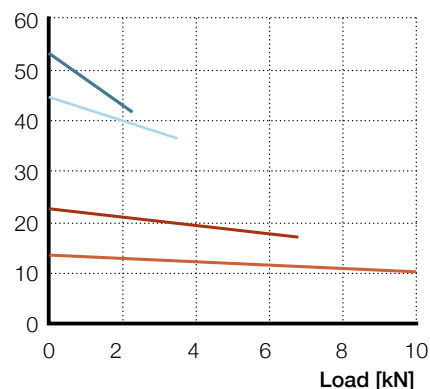
¹⁾ Tolerance S, if S ≤ 300 (+2); if S > 300 (+3)

²⁾ Tolerance S, if S ≤ 300 (–2, –0,5); if S > 300 (–3, –1)

Performance diagrams

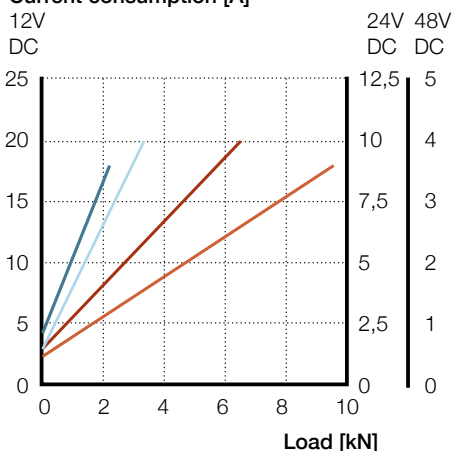
Speed-load diagram

Speed [mm/s]



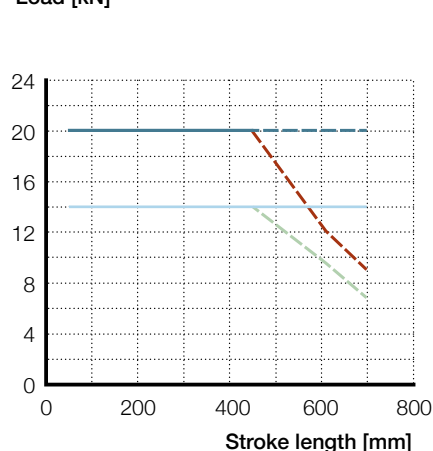
Current load diagram

Current consumption [A]



Static load diagram

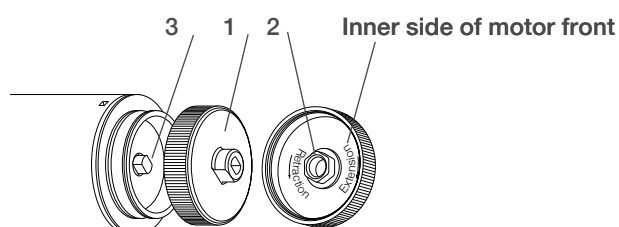
Load [kN]



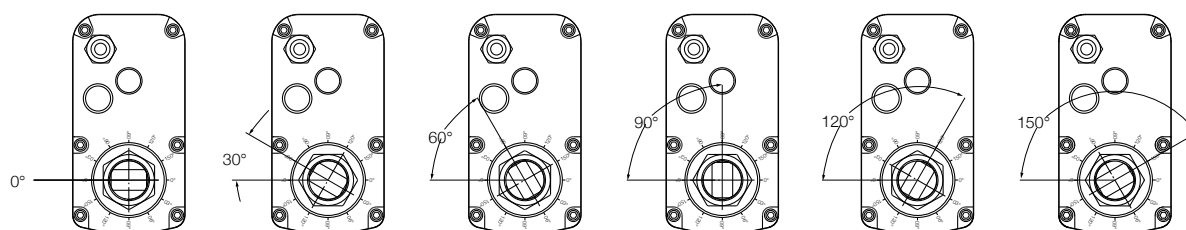
- Rated push force 2 300
- Rated push force 3 500
- Rated push force 6 800
- Rated push force 10 000
- Ultimate CAHB-22-xxE (push)
- Ultimate CAHB-22-xxE (pull)
- Recommended CAHB 22-xxE (push)
- Recommended CAHB 22-xxE (pull)

Manual override

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



Attachment



Electrical specifications

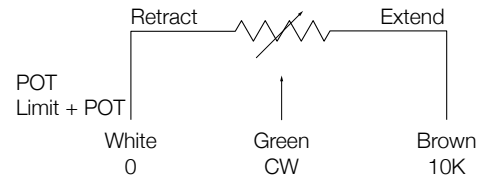
Wire connection with no signal

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

Potentiometer

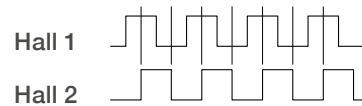


Wire connection with encoder

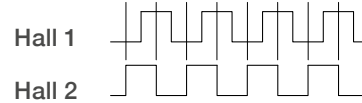
Wire no.	AWG	Colour	Application
1	26	Green	Sensor signal 1 Encoder
2	26	Yellow	Sensor signal 2 Encoder
3	26	Black	Sensor power GND Encoder
4	26	Red	Sensor power 5 V Encoder
5	14	Red	Motor power(+)=> Extension, (-)> Retraction
6	14	Black	Motor power(-)> Extension, (+)> Retraction

Encoder

Signal CCW extension



Signal CW retraction

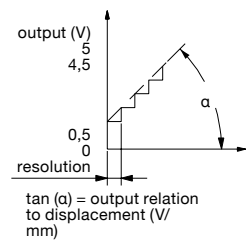


Wire connection with absolute analog output

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

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 $0,5 \pm 0,15$ 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

C A H B - 2 2 -		E		B		0		T		0 0 0	
Type											
Voltage											
12 V DC											
24 V DC											
48 V DC											
12 V DC with manual override											
24 V DC with manual override											
48 V DC with manual override											
Load											
2 300 N											
3 500 N											
6 800 N											
10 000 N											
Design											
Stroke											
100 mm											
150 mm											
200 mm											
250 mm											
300 mm											
350 mm											
400 mm											
450 mm											
500 mm											
600 mm											
700 mm											
Retracted length ¹⁾											
Stroke											
with limit switch without position output											
with position output											
100 mm											
150 mm											
200 mm											
250 mm											
300 mm											
350 mm											
400 mm											
450 mm											
500 mm											
600 mm											
700 mm											
without limit switch											
100 mm											
150 mm											
200 mm											
250 mm											
300 mm											
350 mm											
400 mm											
450 mm											
500 mm											
600 mm											
700 mm											
Ingress protection											
Standard: IP69K/IP66M											
Attachment diameter: (Front and rear)											
Hole Ø13,1 H11 (+0, +0,11 mm)											
Hole Ø12,8 H11 (0, +0,11 mm)											
Hole Ø12,5 H11 (+0, +0,11 mm)											
Hole Ø14 H11(+0, +0,11mm)											
Hole Ø12,2 H11(+0,+0,11mm)											
U fork hole 12.2 H11											
U fork hole 12.8 H11											
Customized											
Attachment orientation											
Standard (0°)											
30°											
60°											
90°											
120°											
150°											
Customized											
Option 1: Limit switch											
None (mandatory for 2 300 N and 3 500 N version and the 48 V DC version)											
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)											
Option 2: Position output											
None											
Absolute analog output											
Potentiometer											
Encoder											
Thermal protection											
Standard: Built-in thermal switch											
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



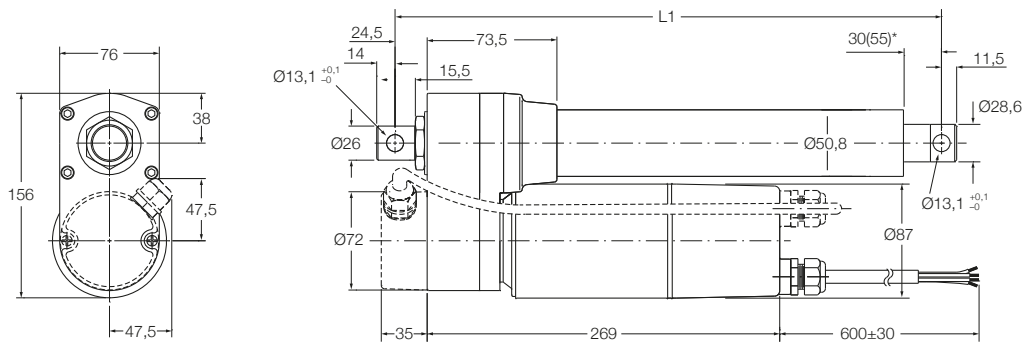
Technical data

		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

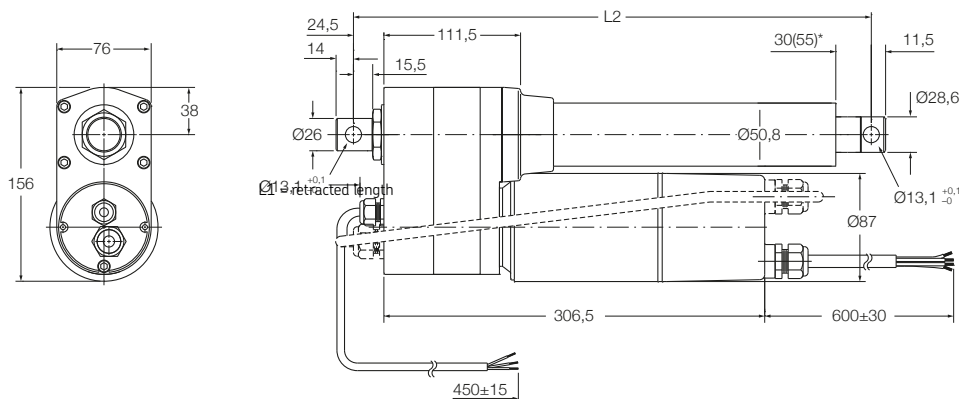
Basic configuration (dashed line for optional limit switch)



Legend

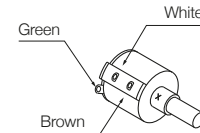
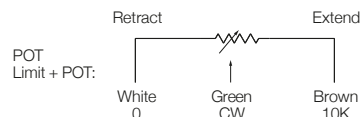
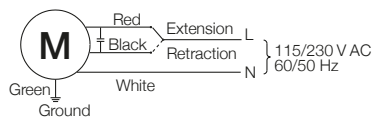
L1 = retracted length
* 55 = dimension with limit switch

Optional potentiometer (dashed line for optional limit switch)



Legend

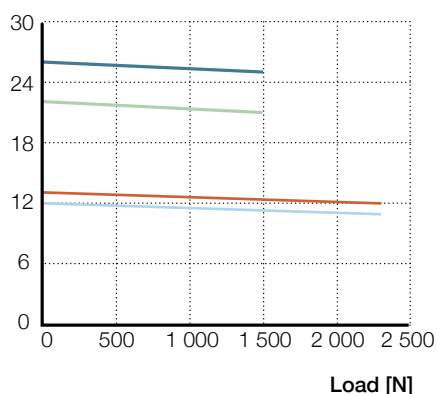
L2 = retracted length
* 55 = dimension with limit switch



Performance diagrams

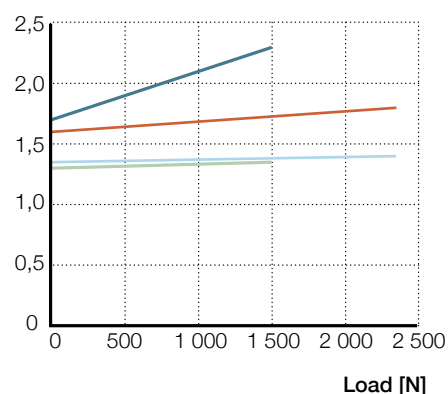
Speed-load diagram

Speed [mm/s]



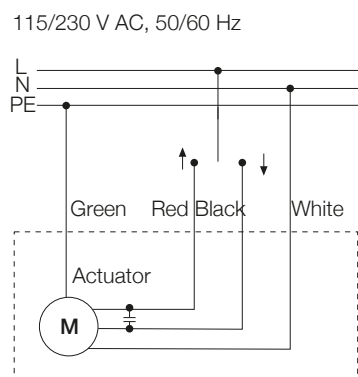
Current-load diagram

Current consumption [A]

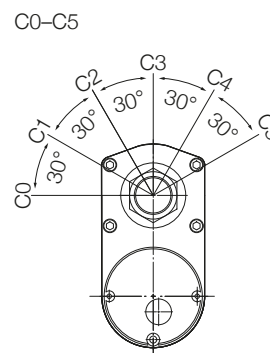


— 1 (115 VAC) — 1 (230 VAC) — 2 (115 VAC) — 2 (230 VAC)

Connecting diagram



Different rear attachment



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 = $\pm 5,0$ mm (If S $\geq$ 305 mm, S = $\pm 7,5$ mm) ²⁾ Tolerance: S = $\pm 2,5$ mm and L1 = $\pm 3,8$ 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 = $\pm 5,0$ mm (If S $\geq$ 305 mm, S = $\pm 7,5$ mm) ²⁾ Tolerance: S = $\pm 2,5$ mm and L2 = $\pm 3,8$ 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

C A H B 3 0		A						A				0		0 0 0	
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



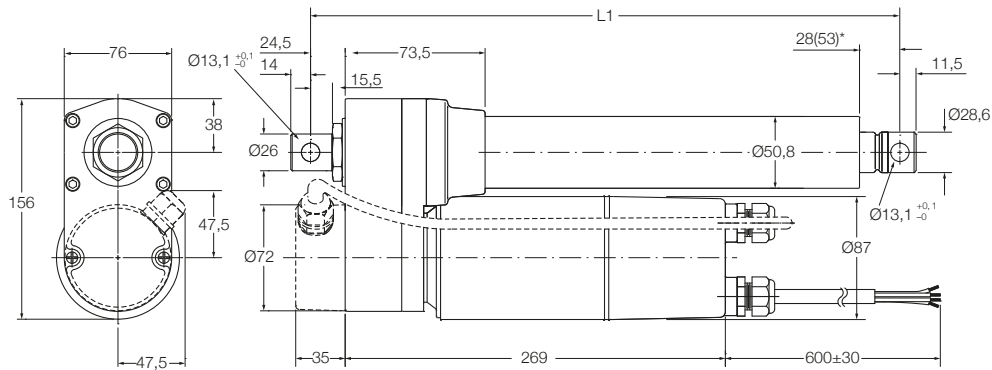
Technical data

		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 [L](#) **page 35**
For outdoors application, please contact SKF Motion Technologies.

Dimensional drawing

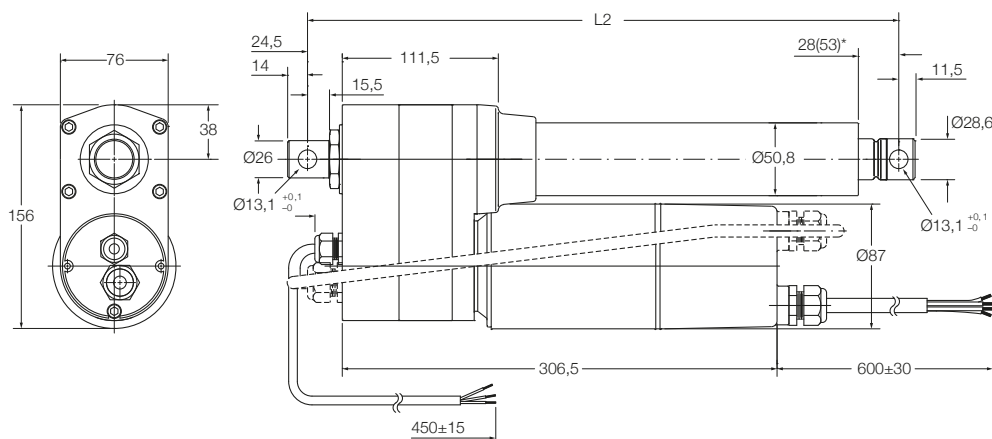
Basic configuration (dashed line for optional limit switch)



Legend

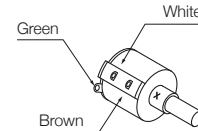
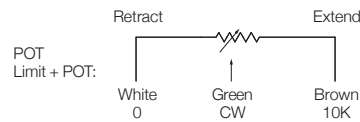
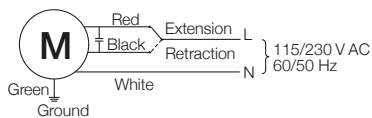
L1 = retracted length
* 53 = dimension with limit switch

Optional potentiometer (dashed line for optional limit switch)



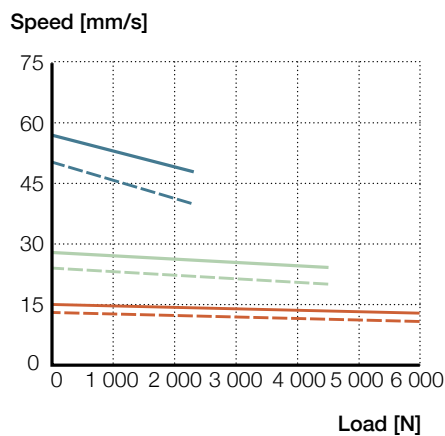
Legend

L2 = retracted length
* 53 = dimension with limit switch

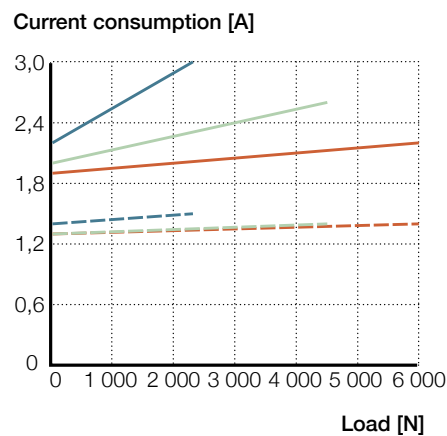


Performance diagrams

Speed-load diagram

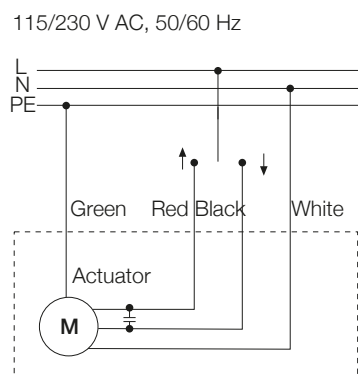


Current-load diagram

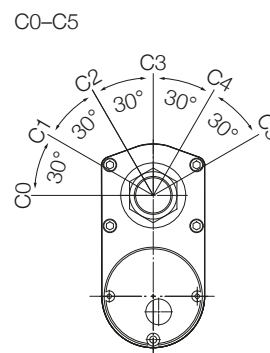


— 1 (115 VAC) — 2 (115 VAC) — 3 (115 VAC)
 - - 1 (230 VAC) - - 2 (230 VAC) - - 3 (230 VAC)

Connecting diagram



Different rear attachment



Electrical specifications

Stroke (mm)	With limit switch ¹⁾						Without limit switch ²⁾					
	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 = $\pm 5,0$ mm (If $S \geq 305$ mm, $S = \pm 7,5$ mm)

²⁾ Tolerance: S = $\pm 2,5$ mm and L1 = $\pm 3,8$ mm

Basic configuration												
Stroke (mm)	With limit switch ¹⁾						Without limit switch ²⁾					
	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 = $\pm 5,0$ mm (If $S \geq 305$ mm, $S = \pm 7,5$ mm)

²⁾ Tolerance: S = $\pm 2,5$ mm and L2 = $\pm 3,8$ 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

	C	A	H	B	3	1	-		-	N	-							-	A	-					0	-	0	0	0	
Type																														
Voltage																														
115 V AC																														
230 V AC																														
Load																														
2 300 N																														
4 500 N																														
6 000 N																														
Screw																														
Ball screw																														
Stroke																														
102 mm																														
153 mm																														
204 mm																														
305 mm																														
457 mm																														
610 mm																														
Retracted length																														
Stroke																														
with limith switch																														
102 mm																														
153 mm																														
204 mm																														
305 mm																														
457 mm																														
610 mm																														
without limith switch																														
102 mm																														
153 mm																														
204 mm																														
305 mm																														
457 mm																														
610 mm																														
IP																														
Standard (IP 65)																														
Front attachment																														
Standard (hole: Ø 13,1 mm)																														
Customized																														
Rear attachment																														
Standard (0° and hole: Ø 13,1 mm)																														
30°																														
60°																														
90°																														
120°																														
150°																														
Customized																														
Option 1:																														
None																														
Limit switch (only for load version 6 000 N)																														
Option 2:																														
None																														
Potentiometer																														
Customization																														

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/m³ 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 Standards	CAHB-20xE, CAHB-21xE, CAHB-22xE		CAHB-10		CAHB-30, CAHB-31	
	Performance	Report No.	Performance	Report No.	Performance	Report No.
Vibration EN60068-2-6 (Fdb) EN60068-w2-6(Fc)	Test Item: Random vibration Frequency (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: 10 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 Dwell (Grms) 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 Standards	CAHB-20xE, CAHB-21xE, CAHB-22xE		CAHB-10		CAHB-30, CAHB-31	
	Performance	Report No.	Performance	Report No.	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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