

# Linear Actuator LA20 Inline Data Sheet



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## Introduction



LA20 is a slim inline actuator created to cover a wide range of applications, where design, size and power are crucial. The combination of a high lifting capacity of 2,500 N with its robust but stylish, small form factor makes the LA20 the ideal solution for many of today's demanding applications.

The actuator is equipped with a socket for exchangeable cables and is to be used with an angled Microfit 30 Deg plug.

Some of the benefits that LA20 Inline offers you:

- Compact and slim design
- High lifting capacity
- Exchangeable cable
- Feedback options for positioning

LA20 is a small inline actuator with a robust design, high efficiency, high lifting capacity at 2500 N, feedback signals for positioning and electrical endstop. It withstands harsh environments within the medical industry.

The LA20 Inline can be used in various applications where space is limited or where size is important.

## Features and options

Load in push:	2500 N
Load in pull:	800 N
Dynamic push and pull:	Actuators are designed for push or pull applications. If a combination is required, please contact your local LINAK salesperson.
Housing colour:	Black (RAL 9005), black outer tube, or Light grey (RAL 7035) Black/grey only available as special solution
Protection class:	IPX4, IPX6
Motor:	24VDC, standard motor (type B or G)
Stroke length:	20 – 300 mm (in steps of 1 mm) (Stroke from 201-300 mm will add 20 mm extension)
Built-in dimensions:	170 mm + stroke length (minimum 220 mm)
Mechanical spline:	Yes, as option (will add 20 mm to BID)
Static safety factor:	2.5 in push and 5.0 in pull
Noise level:	Max 58 dB(A) (at nominal voltage and with no load, according to EN ISO 3743-1)
Exchangeable cable:	Yes, LA20 connection plug (Microfit 30 Deg) (Always use cable lock)
Back fixture material:	Solid composite (plastic bushings inside)
Nut:	Guided
Safety nut:	Yes. In pull only for 6 mm spindle pitch
Feedback options:	Dual Hall or Hall potentiometer
Piston rod eye:	Steel Ø22 mm +/- 0,25 mm

## Usage

Operation temperature:	+5 °C to +45 °C normal operating temperature -27 °C to +50 °C (according to test conditions ISO 7176-9)
Storage temperature:	-40 °C to +70 °C (according to ISO 7176-9)
Compatibility:	Compatible with LINAK control boxes. Please contact LINAK.
Relative humidity:	20% to 80% – non-condensing
Atmospheric pressure:	700 to 1060 hPa
Meters above sea level:	Max. 3000 meters
Duty cycle:	Max. 10%, 2 minutes continuous use followed by 18 minutes not in use
Cycles:	The LA20 life cycle test has been performed with a stabilised power supply (10% duty cycle) on a 120mm stroke actuator at max. load for 10,000 cycles (at ambient temperature)
Flammability rating:	UL94-V0
Approvals:	IEC60601-1 ANSI/AAMI ES60601-1 CAN/CSA-22.2 No 60601-1 In compliance with ISO 7176-8

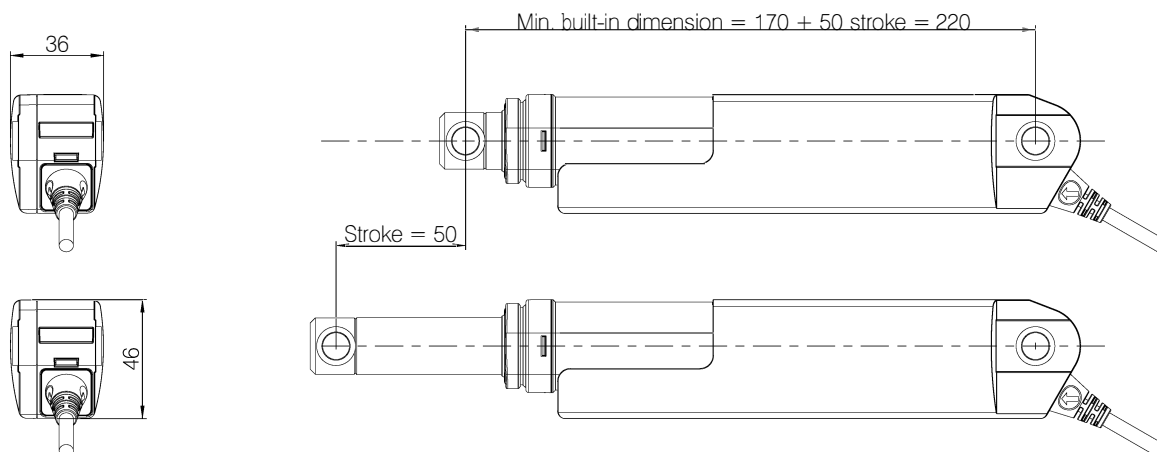
## Ordering example

Actuator type:	LA 20			
Spindel pitch:	060	025 = 2.5 mm (2500 N) 050 = 5 mm (800 N)	030 = 3 mm (2200 N) 060 = 6 mm (600 N)	040 = 4 mm (1300 N)
Stroke length:	050	xxx = mm (valid from 20 mm to 300 mm)		
Safety:	00	00 = No safety options 0C = Mech. spline without safety nut	0A = Safety nut for Push 0D = Mech. spline with safety nut	0P = Safety nut for pull
Feedback:	00	00 = None (F1)	0A = Hall Potentiometer (F7)	0H = Dual Hall (Digital) (F2) 0M = Dual Hall (Encoded) (F3)
Platform:	0	0 = None		
Motor type:	B	A = 12 VDC (V1) B = 24 VDC (V2) Running mainly with battery (e.g. CBJ1, CBJ2, CBJH, CBJC, CB8A & Customer supplied CB) G = 24 VDC (V3) Running mainly on LINAK CB platforms e.g (CO61, CO71, CO41, CA30/40)		
Endstop:	0	0 = Power switch (E1)	1 = Signal switch (E2)	2 = Encoded (E3)
IP degree:	6	4 = IPx4	6 = IPx6	
Housing colour:	-	- = Black (RAL9005) - black outer tube	+ = Light Grey (RAL7035)	
Back fixture:	0	0 = Ø10.2 mm with plastic bushings	1 = Ø12.3mm without plastic bushings	
Piston rod eye:	0	0 = Steel solid, Ø10.2 mm with plastic bushings 1 = Steel solid, Ø12.3 mm without plastic bushings 2 = Steel with 6.1 mm slot, Ø10.2 mm with plastic bushings (+6,5 BiD)	3 = Steel with 6.1 mm slot, Ø10.2 mm without plastic bushings (+6,5 BiD)	4 = Steel with 6.1 mm slot, Ø12.3 mm without plastic bushings (+6,5 BiD)
Gear Option:	3	3 = 3 Stage gear, ratio - 1 : 56		
Not Used:	0	0 =		
Safety Factor:	2	1 = 1.5	2 = 2.5	
Not Used:	0	0 =		
Load Direction:	0	0 = Push	P = Pull	
Not Used:	000	000 =		
Installation dimension:	220	xxx = mm (min. installation 220 mm) (extension from 6 mm to 220 mm)		
Chosen item number:		2006005000000806-0030200000220		

### Note:

- Cable must be ordered separately
- LA20 comes with one cable lock. If extra cable locks are needed they must be ordered separately for LA20 (for item number see later page)
- Noise can occur if plastic bushings are not fitted in the piston rod eye/Back fixture
- Black housing with grey outer tube is available as special solution

## Dimensions



### Dimension drawings with extended BID

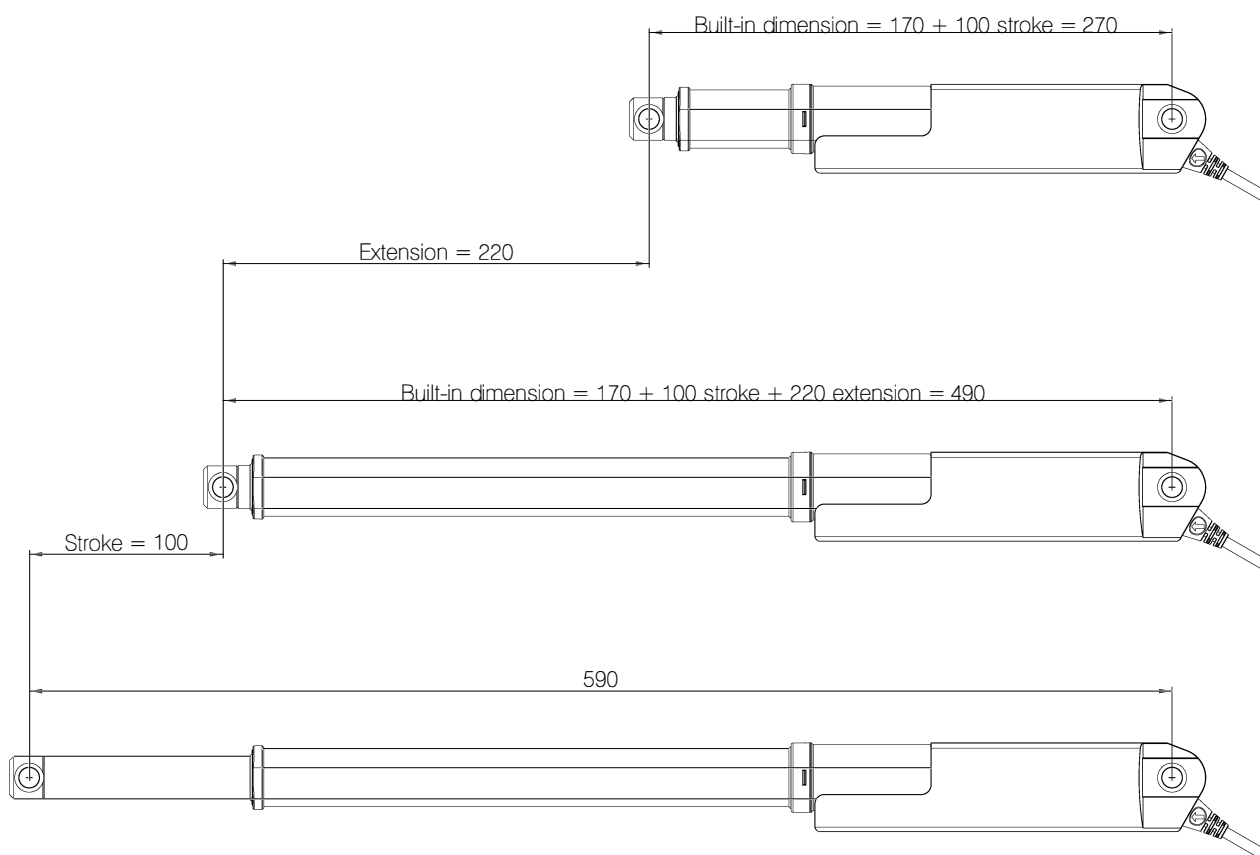
(100 mm stroke without extension and addition of 220 mm extension)

It is possible to order LA20 with extended built-in dimensions.

The total BID cannot exceed 490 mm (incl. extension).

For steps between 1 mm and 5 mm contact LINAK A/S.

For steps of 5 mm use eCon.



Tolerances: For Built-In Dimensions and stroke  $\pm 2$  mm.

Drawing No: 1001W4011

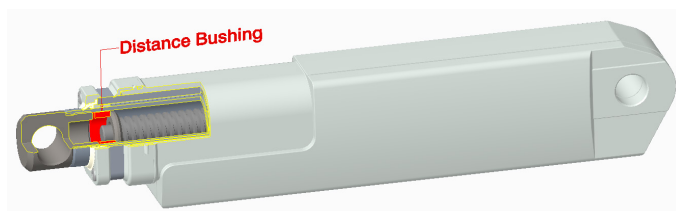
## Built-in dimensions

The built-in dimension depends on the chosen safety nut and stroke length.

Please see the table below to decide on built-in dimension.

Safety option	Pitch [mm]	Stroke [mm]	Minimum BID [mm]
0 = No safety nut in push/pull	2.5,3,4,5 & 6	20-49	220
		50-200	170 + stroke
		201-300	190 + stroke
1 = Safety nut in push	2.5,3,4,5 & 6	20-40	220
		50-200	170 + stroke
		201-300	190 + stroke
2 = Safety nut Pull	6	20-37	220
		38-200	182 + stroke
		201-300	202 + stroke
3 = Mechanical spline	2.5,3,4 & 5	20-21	220
		22-200	198 + stroke
		201-300	218 + stroke
	6	20-24	220
		30-200	190 + stroke
		201-300	210 + stroke
4 = Mechanical spline + safety nut	2.5,3,4 & 5	20-21	220
		22-200	198 + stroke
		201-300	218 + stroke
	6	20-29	220
		30-200	190 + stroke
		201-300	220 + stroke

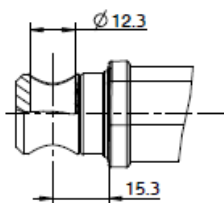
A specific stroke length will increase the BID with minimum 6 mm due to installation of a distance bushing that ensures the mechanical endstop to be activated at inwards direction.



## Details on piston rod eyes

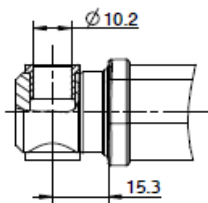
	Piston rod eyes				
	Picture 1	Picture 2	Picture 3	Picture 4	Picture 5
<b>Specification</b>	Solid No bushings	Solid With bushings	Slot No bushings	Slot With bushings	Slot No bushings
<b>Added BID</b>	-	-	+ 6.5 mm*	+ 6.5 mm*	+ 6.5 mm*
<b>Piston rod eye combcicode</b>	1	0	4	2	3

**Picture 1**



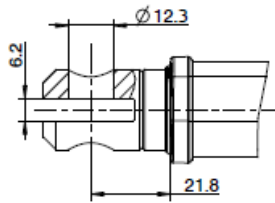
Piston: 1001W1040  
Material: Steel Solid  
Bushings: No

**Picture 2**



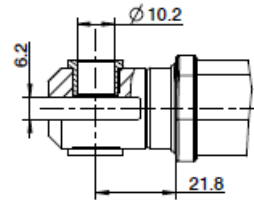
Piston: 1001W1040  
Material: Steel Solid  
Bushings: Yes

**Picture 3**



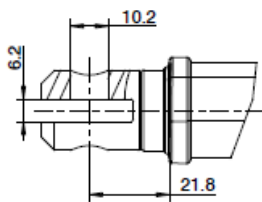
Piston: 0231016  
Material: Steel  
Bushings: No

**Picture 4**



Piston: 0231016  
Material: Steel  
Bushings: Yes

**Picture 5**

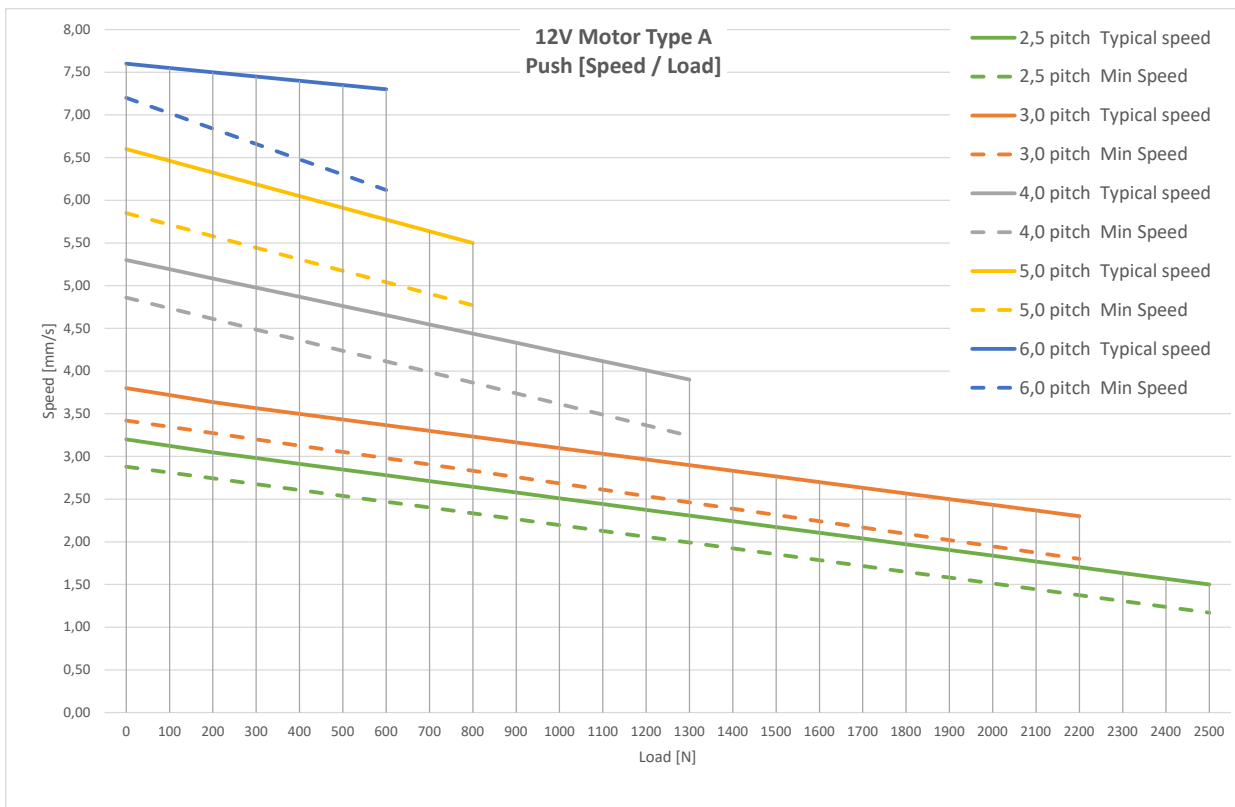


Piston: 0231033  
Material: Steel  
Bushings: No

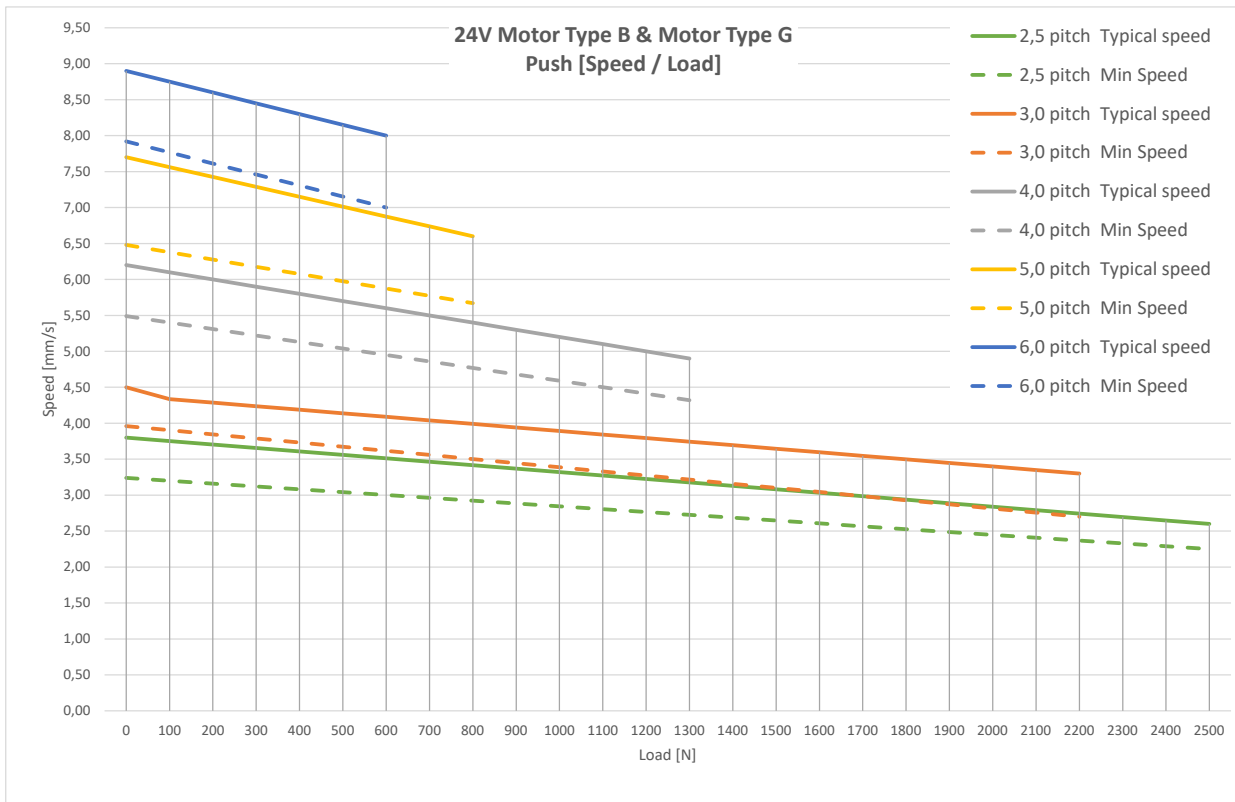
\* Use 7 mm BID for the combicode

# Speed and load curves

## Motor Type A, push

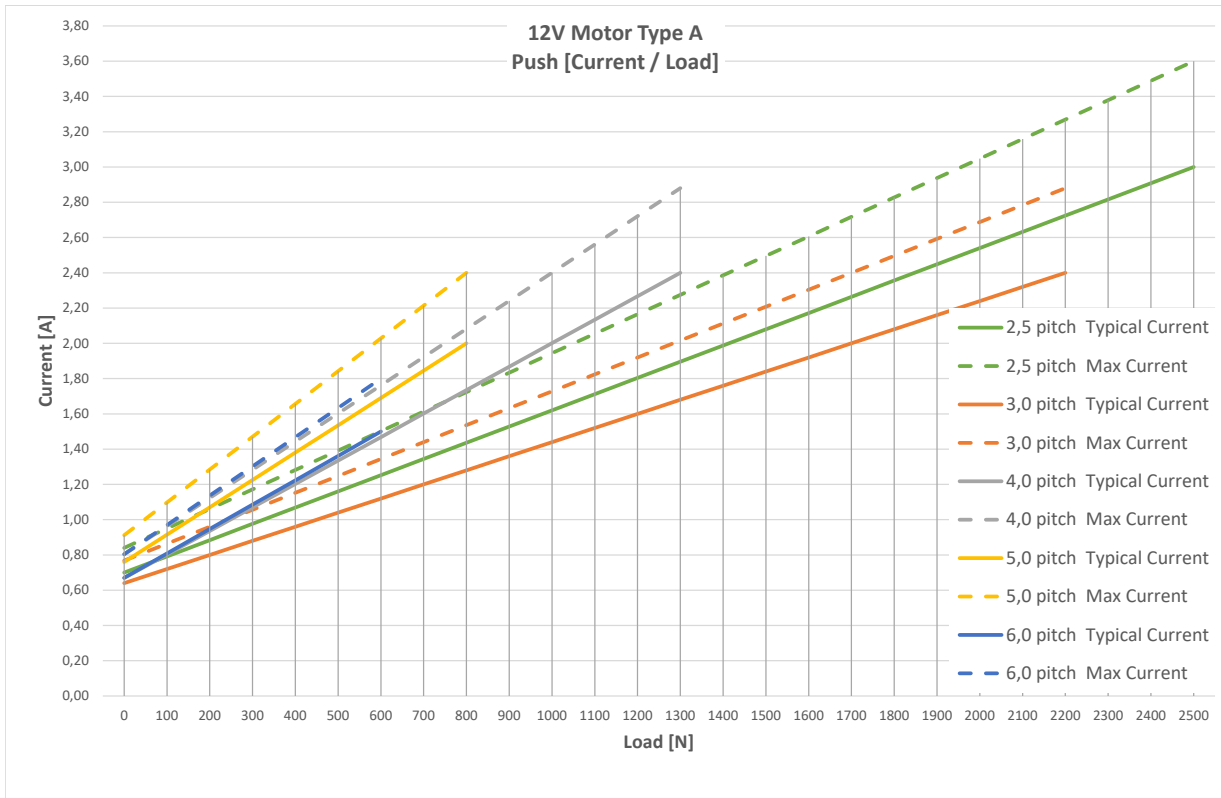


## Motor Type B and G, push

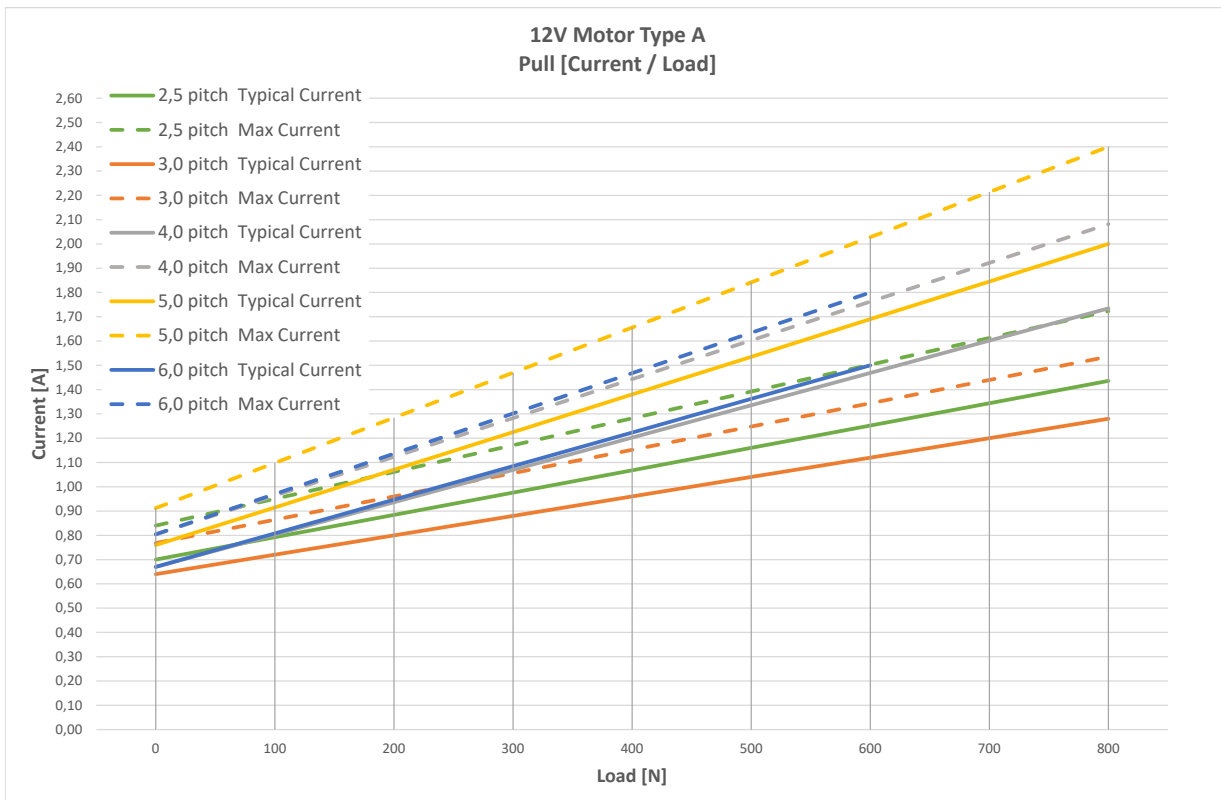


# Current and load curves

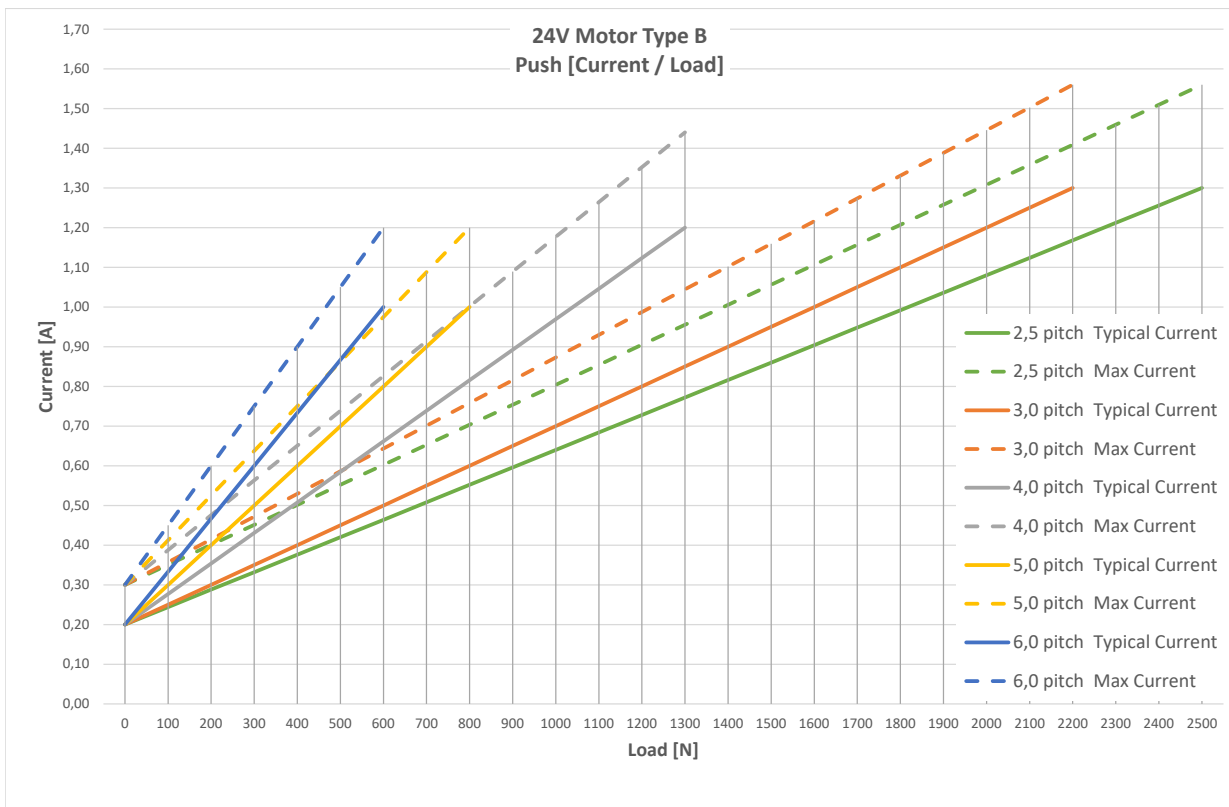
## Motor Type A, push



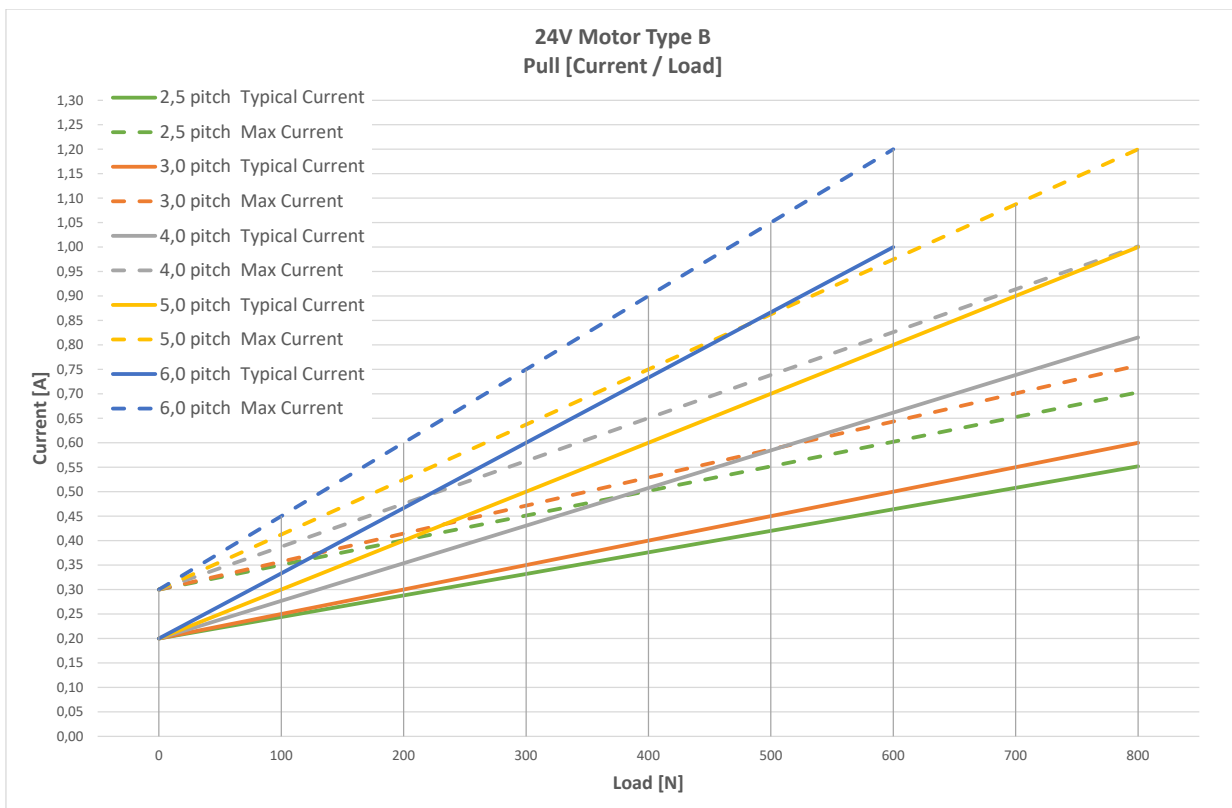
## Motor Type A, pull



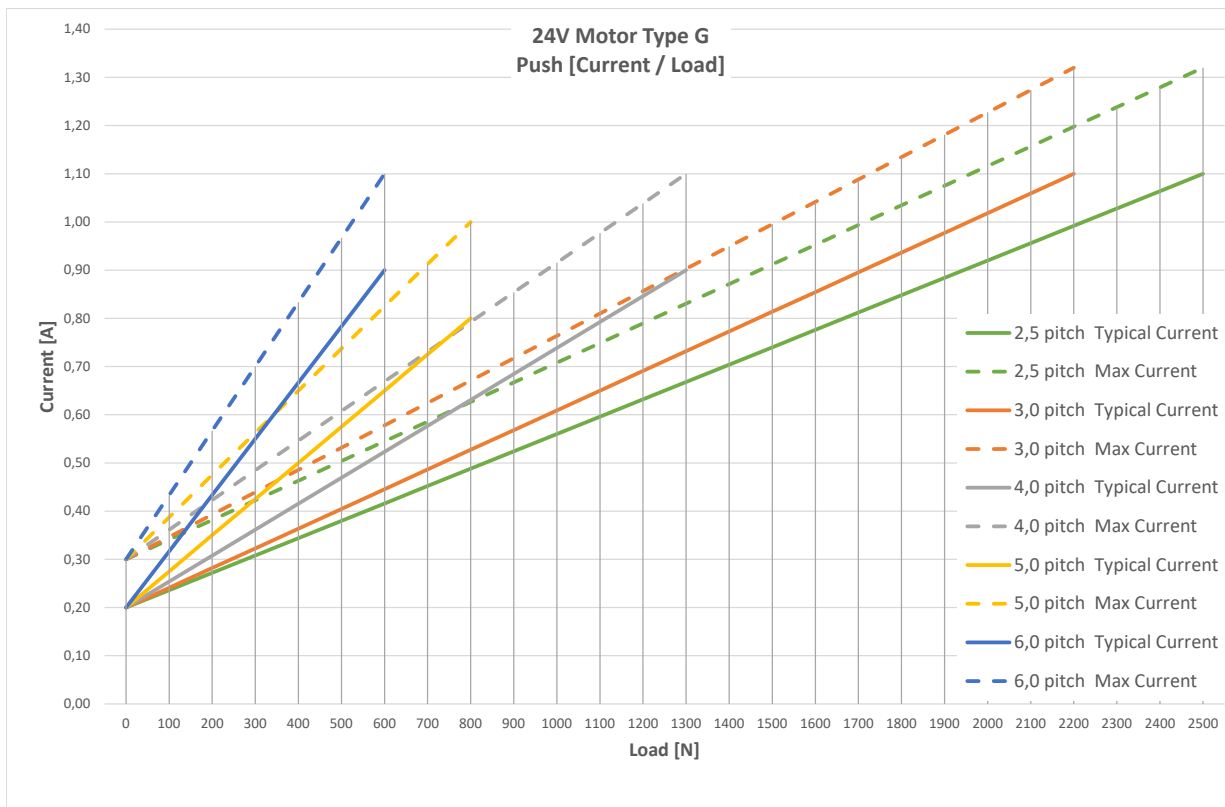
## Motor Type B, push



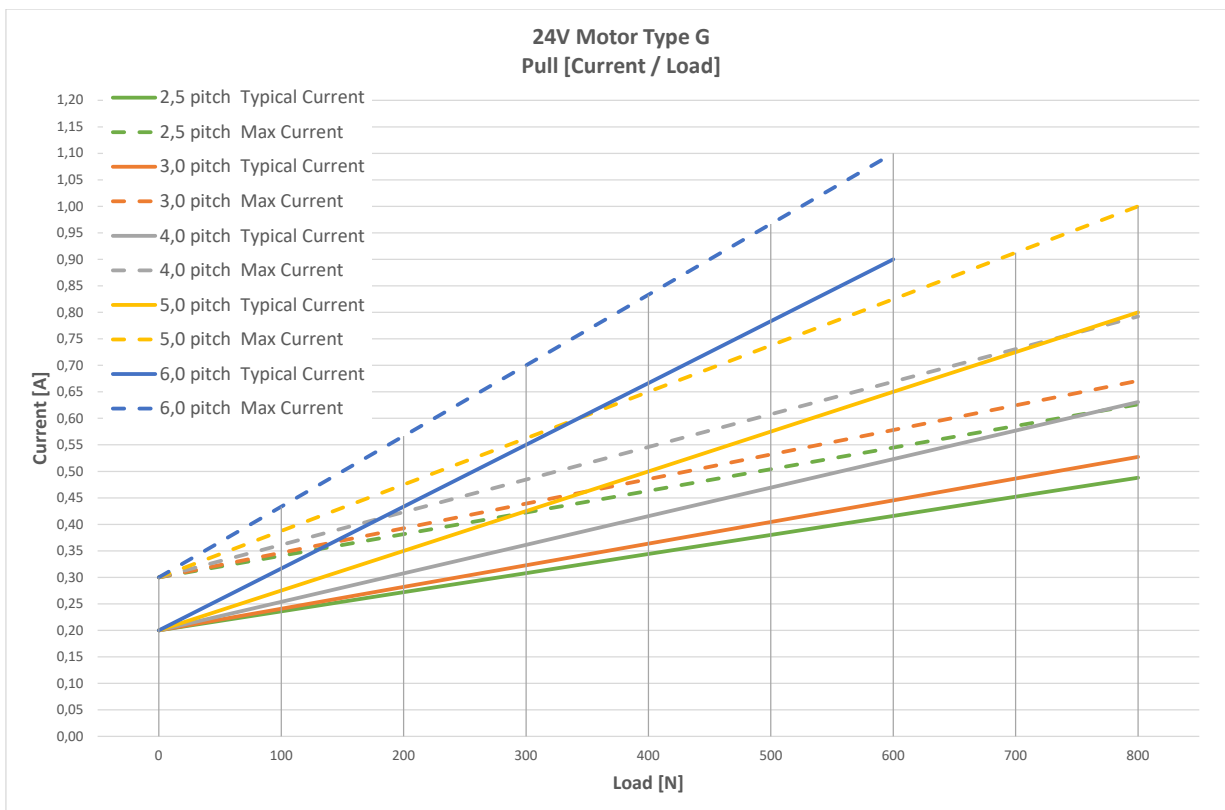
## Motor Type B, pull



### Motor Type G, push



### Motor Type G, pull



## Input/output specifications

### Dual Hall positioning

Item	Specification	Comment	
Pin configuration	Pin1	GND	
	Pin2	VCC	
	Pin3	M+	
	Pin4	HALL A	
	Pin5	HALL B	
	Pin6	M-	

### Dual Hall encoded

Item	Specification	Comment																						
Pin configuration	Pin1	External supply: 0 V	<table border="1"> <thead> <tr> <th>Interval</th> <th>Hall-A</th> <th>*EOS</th> </tr> </thead> <tbody> <tr> <td>2.65V-3.25V</td> <td>LOW</td> <td>NONE</td> </tr> <tr> <td>2.15V-2.65V</td> <td>HIGH</td> <td>NONE</td> </tr> <tr> <td>1.65V-2.15V</td> <td>LOW</td> <td>OUT</td> </tr> <tr> <td>1.15V-1.65V</td> <td>HIGH</td> <td>OUT</td> </tr> <tr> <td>0.65V-1.15V</td> <td>LOW</td> <td>IN</td> </tr> <tr> <td>0.05V-0.65V</td> <td>HIGH</td> <td>IN</td> </tr> </tbody> </table>	Interval	Hall-A	*EOS	2.65V-3.25V	LOW	NONE	2.15V-2.65V	HIGH	NONE	1.65V-2.15V	LOW	OUT	1.15V-1.65V	HIGH	OUT	0.65V-1.15V	LOW	IN	0.05V-0.65V	HIGH	IN
	Interval	Hall-A		*EOS																				
	2.65V-3.25V	LOW		NONE																				
	2.15V-2.65V	HIGH		NONE																				
	1.65V-2.15V	LOW		OUT																				
	1.15V-1.65V	HIGH		OUT																				
	0.65V-1.15V	LOW		IN																				
0.05V-0.65V	HIGH	IN																						
Pin2	VCC																							
Pin3	M+ (motor/power)																							
Pin4	HALL A, analogue encoded (Hann-A +EOS* IN/OUT)																							
Pin5	HALL B with dual Hall or N/C when testing without dual Hall																							
Pin6	M- (motor/power)																							

### Hall potentiometer feedback

Item	Specification	Comment	
Pin configuration	Pin1	External supply: V0	Actuator connector front view:
	Pin2	VCC	
	Pin3	M+ (motor/power)	
	Pin4	Hall potentiometer	
	Pin5	Not connected	
	Pin6	M- (motor/power)	

### Motor specification

Item	Specification	Comment	
Pin connection	Pin1		Outwards: Pin3: + Pin6: -  Inwards: Pin3: - Pin6: +
	Pin2		
	Pin3	M+/-	
	Pin4		
	Pin5		
	Pin6	M-/+	

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