



There are two common ways to determine the *Body Length* for an actuator. The first is to start with the *Overall Length* and subtract, the second is to start with the *Stroke* and add. The easiest option is to start with the *Overall Length* and subtract the *Drive End Length* and the *Return End Length* to find the *Body Length*. This is most commonly done when the actuator must fit inside of an enclosed cabinet and the engineer's goal is to obtain the maximum amount of *Stroke* possible.

Designer's TIP

After doing the math to determine the body length, round up to the nearest 10 or 25 mm. While there are no "standard" lengths for actuators, these are the most commonly sold lengths and generally have the shortest lead times.

The most common method is to start with the desired *Stroke* and add the values for the *Carriage Length* and *Overtravel (Safety) Zones*. The MINIMUM amount PBC Linear allows is 25 mm for each *Overtravel Zone* (50 mm total).

The RECOMMENDED default amount is at least 25 mm for each *Overtravel Zone* (50 mm total). For added safety, the *Overtravel Zone* could be two full revolutions of the motor, with a minimum of 25 mm per side.

Designer's TIP

Don't forget to account for space that might be taken up by the mounting system, motor mount, gear box, cables & cable carriers, motor & drive or bellows/covers.

The most complex (and accurate) way to determine the *Overtravel Zone* is to determine the reaction time of the sensor/switch and to calculate how far the system will travel while the sensor is tripped and the electrical signal is sent back to the drive/controller and then the drive tells the motor to stop. This method is complex and typically not recommended.

Why do you need Overtravel (Safety) Zones?

- **Ease of Installation:** The 25 mm on each end allows for easier placement during installation. If the actuator is ordered based upon the exact amount of stroke required, the installing technician must locate the actuator within ± 0.1 mm, which is sure to add cost! The Overtravel (Safety) Zones can be used as an installation buffer.
- **Increase Reliability:** Unlike hydraulic actuators, most belt and screw driven actuators are not designed to be repetitively run into the hard stop at each end of travel. If bumpers are included in the design of the actuator, they are meant to be an occasional stop used during the initial setup and homing of the system. These bumpers are not meant to be repetitively used when the actuator is at full load/velocity.
- **Reduce Liability:** Avoid the possible pinch points typically created near the end of the stroke.

• PBC Linear warranty specifically states that sensors must be used to prevent overtravel of the actuator and that repeated contact of the carriage to the end of travel will eventually cause a premature failure of the system.

This contact will void the manufacturer's warranty.

How To Calculate Body Length

1. Enter a minimum of 25 mm for overtravel on idle end
2. Specify stroke length in mm
3. Enter 130 mm (MTB 042), 150 mm (MTB 055), or 230 mm (MTB 080) for carriage length
4. Enter a minimum of 25 mm for overtravel on drive end
5. Add amounts together and enter SUBTOTAL
6. Enter TOTAL BODY LENGTH (Round up to nearest 10 mm)
7. When ordering, enter TOTAL BODY LENGTH in BODY LENGTH column

Body Length Calculation Table		Example Mtb042
Overtravel Idle End (≥ 25 mm)		25
Stroke Length		655
Carriage Length (130, 150, 230 mm)		150
Overtravel Drive End (≥ 25 mm)		25
(Add Amounts 1-4) + Actual Body Length (mm) =		855
OPTIONAL Recommended Body Length (Round Subtotal up to nearest 10 mm)		860

ORDERING GUIDE

MTB	042	D	0860	XX	X	X	X
Series	Size (mm) (Base x Height)	System Type*	Body Length**	Shaft Diameter	Shaft Type	Number of Carriage	Guidance Type
MTB Belt Driven Unit	42 x 42 mm	D = Driven	2000 mm (max.) Must include 50 mm over-travel	10 = 10 mm 12 = 12 mm	F = Female hollow (10, 12) L = Left Male (12) R = Right Male (12) B = Both Male (12)	1 2 3 4	2 = Profile rail w/2 runner blocks per carriage
		Undriven U = Undriven		Undriven 00 = No shaft	Undriven 0 = No shaft (undriven)		