**General Motion Equation (OK)**

**Time**

**Distance**

**Acceleration**

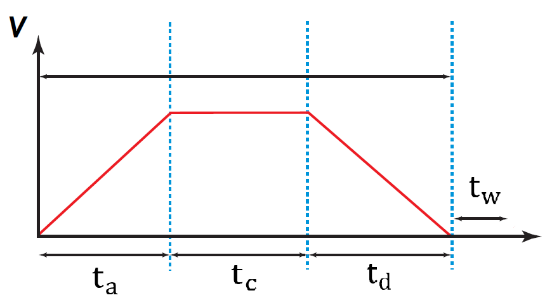
**Velocity**

**PBA Motor sizing Equation : Motion Calculation**

**Linear Motion (OK)**

* d :

1. **For Custom motion profile**



1. **For Trapezoidal motion profile**

1. **For Triangular motion profile**

**For Triangular motion profile**  (minimum two parameter need out of four) **(OK)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Remarks** | **Formula** |
| 0 | 0 | 0 | 0 | Motion cannot be determined | NA |
| 0 | 0 | 0 | 1 | Motion cannot be determined | NA |
| 0 | 0 | 1 | 0 | Motion cannot be determined | NA |
| 0 | 0 | 1 | 1 | No assumption (Consistent Data) |  |
| 0 | 1 | 0 | 0 | Motion cannot be determined | NA |
| 0 | 1 | 0 | 1 | No assumption (Consistent Data) |  |
| 0 | 1 | 1 | 0 | No assumption (Consistent Data) |  |
| 0 | 1 | 1 | 1 | No assumption (Consistent Data) |  |
| 1 | 0 | 0 | 0 | Motion cannot be determined | NA |
| 1 | 0 | 0 | 1 | No assumption (Consistent Data) |  |
| 1 | 0 | 1 | 0 | No assumption (Consistent Data) |  |
| 1 | 0 | 1 | 1 | No assumption (Consistent Data) |  |
| 1 | 1 | 0 | 0 | No assumption (Consistent Data) |  |
| 1 | 1 | 0 | 1 | No assumption (Consistent Data) |  |
| 1 | 1 | 1 | 0 | No assumption (Consistent Data) |  |
| 1 | 1 | 1 | 1 | Error Check | If ; (No error)  Else, ‘prompt inconsistent velocity/acceleration data.’  If (No error)  Else, ‘prompt inconsistent velocity/acceleration/travel time/distance data.’ |

**For Trapezoid Motion Profile**  (minimum two parameter need out of four) **(OK)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Remarks** | **Formula** |
| 0 | 0 | 0 | 0 | Motion cannot be determined | NA |
| 0 | 0 | 0 | 1 | Motion cannot be determined | NA |
| 0 | 0 | 1 | 0 | Motion cannot be determined | NA |
| 0 | 0 | 1 | 1 |  |  |
| 0 | 1 | 0 | 0 | Motion cannot be determined | NA |
| 0 | 1 | 0 | 1 |  |  |
| 0 | 1 | 1 | 0 |  |  |
| 0 | 1 | 1 | 1 |  |  |
| 1 | 0 | 0 | 0 | Motion cannot be determined | NA |
| 1 | 0 | 0 | 1 |  |  |
| 1 | 0 | 1 | 0 |  |  |
| 1 | 0 | 1 | 1 |  |  |
| 1 | 1 | 0 | 0 |  |  |
| 1 | 1 | 0 | 1 |  |  |
| 1 | 1 | 1 | 0 |  |  |
| 1 | 1 | 1 | 1 | Error Check | If ; (No error)  Else, ‘prompt inconsistent velocity/acceleration data.’  If (No error)  Else, ‘prompt inconsistent velocity/acceleration/travel time/distance data.’ |

**For Custom Motion Profile** (minimum two parameter need out of four) **(OK)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Remarks** | **Formula** |
| 0 | 0 | 0 | 0 | Motion cannot be determined | NA |
| 0 | 0 | 0 | 1 | Motion cannot be determined | NA |
| 0 | 0 | 1 | 0 | Motion cannot be determined | NA |
| 0 | 0 | 1 | 1 |  |  |
| 0 | 1 | 0 | 0 | Motion cannot be determined | NA |
| 0 | 1 | 0 | 1 |  |  |
| 0 | 1 | 1 | 0 |  |  |
| 0 | 1 | 1 | 1 | No assumption (Consistent Data) |  |
| 1 | 0 | 0 | 0 | Motion cannot be determined | NA |
| 1 | 0 | 0 | 1 |  |  |
| 1 | 0 | 1 | 0 |  |  |
| 1 | 0 | 1 | 1 | No assumption (Consistent Data) | ; |
| 1 | 1 | 0 | 0 |  |  |
| 1 | 1 | 0 | 1 | No assumption (Consistent Data) |  |
| 1 | 1 | 1 | 0 | No assumption (Consistent Data) |  |
| 1 | 1 | 1 | 1 | Error check | If ; (No error)  Else, ‘prompt inconsistent velocity/acceleration data.’  If (No error)  Else, ‘prompt inconsistent velocity/acceleration/travel time/distance data.’ |

**PBA Motor sizing Equation: Force Calculation**

**Linear Motion (OK)**

* : opposing force (N)



**For PIX150B and PIX250B (OK)**

**Note : Linear motor equation able to use for DX B, DX BE, DX F, PIX200, PIX150B, PIX250B, CVC, RVCA, PSM, PSME**

**Force :**  **Linear Motion (OK)**

)

**Multiple motion profiles**

**Safety Factor (OK) \*** Note : \* Except PIX150B, PIX250B

**Recommended motor : DX B, DXBE, DX F, PIX200, CVC, RVCA, PSM, PSME**

1. Calculate SF for all motors
2. User define Safety margin min & Safety margin max in select bar (Default 20% min, 300% max)
3. To display Models that fulfil all of these conditions
4. Two models with the Smallest SF in each FAMILY

(Only for DX B)

Note : Family DX20B, DX30B, 50B, DX50BT, DX65B, DX65BT

DX90B, DX90BT

**Note: To avoid negative value**



**Continuous current (OK) \*** Note : \* Except PIX150B, PIX250B

**Coil temperature (OK)**

(default)

**Constant: (OK)**

For DXB, PIX200, PSM

For DXF, DX50BE, PIX150B, PIX250B, PIX350B

For CVC, RVC, PSME

**Peak current (OK)\*** Note : \* Except PIX150B, PIX250B

**DC bus voltage (OK)**

Note : Max value from individual profile

=

**PIX150B/PIX250B Current Calculation (OK)**

**Peak current (OK)**

**Continuous current (OK)**

**PIX150B/PIX250B Safety Factor (OK)**

**Recommended motor : PIX150B/PIX250B**

1. Calculate for all motors
2. User define Safety margin min & Safety margin max in select bar (Default 30% min, 300% max)
3. To display Models that fulfil all of these conditions

Note: To avoid negative value

Note: To avoid negative value

Note: To avoid negative value

Note: To avoid negative value

**Driver Selection (OK)**

25% safety margin

and

**User interface need to see below topic and below text for Linear Motion (OK)**

**Project detail**

1)  Company Name

2) Project Name

3)  Date

**Axis Detail**

1)Axis Name

2) Motor Category

3) Safety Margin (default : Lower 20%, Upper 300% )  For PIX150B,250B Lower 30%,

**Profiles**

1)   Motion Profile

      a)  Trapezoidal

      b)  Triangular

      c)   Custom

2) Travel Distance (m)

3) Travel Time (s)

4) Max Speed (m/s)

5) Max Acceleration

6) Dwell Time (s)

7) Mass of Load (kg)

8) Angle of Inclination

9) Direction

10) Coefficient of Friction   (Default 0.003)

11) Opposing Force (N)

12) Ambient Temp.   (default )

**Calculated value for one profile**

1) RMS Force (N)

2) Peak Force (N)

3) Frictional Force (N)

4) Acceleration Time    (Accel Time) (s)

5) Cruise Time (s)

6) Deceleration Time    (Decel. Time ) (s)

7) Total Cycle Time (s)

**Calculated value for final profile**

1) Required RMS Force (N)

2) Required Peak Force (N)

3) Total Travel Distance (m)

4) Total Cycle time (s)

5) Total Dwell Time (s)

6) Max Speed (m/s)

7) Max Acceleration

8) Max Ambient Temperature )

9) Recommended Motor

* Motor part number
* SF (%)

10) Selected Motor Display

11) Graphs (Individual motion profile Graphs, Final profile Graphs )

**Selected motor data – Linear (DX B, DX F, DX50BE, PIX200, PIX150B, PIX150B , PSM, PSME) (OK)**

* Motor : part number
* Continuous Force (N)
* Peak Force (N)
* Continuous Current (A)
* Peak Current (A)
* Motor Constant (N/√W)
* Force Constant (N/A)
* Back EMF Constant ( V/(m/s) )
* Resistance L-L (ohm)
* Inductance L-L (mH)
* Continuous Power (W)
* Peak Power (W)
* Coil Weight (kg)
* Coil Length (mm)
* Attractive Force (N)

**Selected motor data – Linear (CVC, RVCA) (OK)**

* Motor : part number
* Continuous Force (N)
* Peak Force (N)
* Continuous Current (A)
* Peak Current (A)
* Motor Constant (N/√W)
* Force Constant (N/A)
* Back EMF Constant ( V/(m/s) )
* Resistance L-L (ohm)
* Inductance L-L (mH)
* Continuous Power (W)
* Peak Power (W)
* Coil Weight (kg)
* Stroke (mm)

**Calculated motor Value for Application (Applicated Value of the Motor)**

1) Required RMS Force (With motor) (N)

2) Required Peak Force (With motor) (N)

3) Coil Temperature )

4) Continues Current (A)

5) Peak Current (A)

6) DC Bus Voltage (V)

7) Safety Factor (%)

For PIX250B/150B

Remove 7) Safety Factor

Add S.F.(Current), S.F. (Force), L.F. (Current), L.F. (Force),

**Drive selection**

1) Recommended Servo driver model number

2) Driver Continues Current (A)

3) Driver  Peak Current (A)

**Report Generate**

Check Sample report file