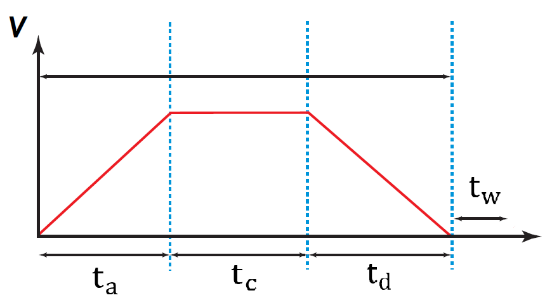
**PBA Motor sizing Equation : Rotary Motion Calculation**

**Rotary 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: Torque Calculation**

* : opposing torque (Nm)

**Torque :**  **Rotary Motion (OK)**

)

**Multiple motion profiles**

**Safety Factor (OK)**

**Recommended motor**

1. Calculate SF 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: Avoid negative value**

**Coil temperature (OK)**

Lookup for , , in the motor database for the selected motor. If is already available no need to derive from .

**If:**

**Else:**

(default)

**Constant: (OK)**

For PDDR

**Continuous current (OK) \***

**Peak current (OK)\***

**DC bus voltage (OK)**

**Driver Selection (OK)**

25% safety margin

and

**User interface need to see below topic and below text for Rotary Motion**

**User Entry**

1) Customer Name

2) Project Name

3)  Axis Name

4)  Date

**User Entry**

1)   Motion Profile

      a)  Trapezoidal

      b)  Triangular

      c)   Custom

2) Travel Distance ()

3) Travel Time (s)

4) Max Speed ()

5) Acceleration

6) Dwell Time (s)

7)

8) Opposing Torque (Nm)

9) Ambient Temp.   (default )

10) Safety Factor      (default : Lower 20%, Upper 300% )

**Calculated value for one profile**

1) RMS Torque (Nm)

2) Peak Torque (Nm)

3) Frictional Torque (Nm)

4) Travel Distance ()

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 Torque (Nm)

2) Required Peak Torque (Nm)

3) Total Travel Distance ()

4) Total Cycle Time (s)

5) Total Dwell Time (s)

6) Max Speed ()

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 – Rotary (PDDR) (OK)**

* Motor : part number
* Continuous Torque (Nm)
* Peak Torque (Nm)
* Continuous Current (A)
* Peak Current (A)
* Motor Constant (Nm/√W)
* Torque Constant (Nm/A)
* Back EMF Constant ( V/(rad/s) )
* Resistance L-L (ohm)
* Inductance L-L (mH)
* Continuous Power (W)
* Peak Power (W)
* ()
* DDR Diameter (mm)

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

1) Required RMS Torque (With motor) (Nm)

2) Required Peak Torque (With motor) (Nm)

1) Coil Temperature )

2) Continues Current (A)

3) Peak Current (A)

4) DC Bus Voltage (V)

5) Safety Factor (%)

**Drive selection**

1) Recommended Servo driver model number

2) Driver Continues Current (A)

3) Driver  Peak Current (A)

**Report Generate**

Check Sample report file