

Resolution for 40 TPI Leadscrew

10 Position, 12 Position, 16 Position Encoders Data Sheet

Linear Motion: 10mm Motors/w 10 position encoders

Gearhead Ratio	Max Travel Rate ²		Resolution ¹	
	Inch per second	mm per second	µinch per count	µm per count
16:1	0.2604	6.6146	39.0625	0.992189484379
64:1			9.765625	0.992189484379
256:1			2.44140625	0.0620118427737
1024:1			0.6103515625	0.0155029606934

Linear Motion: 10mm Motors/w 12 position encoders

Gearhead Ratio	Max Travel Rate ²		Resolution ¹	
	Inch per second	mm per second	µinch per count	µm per count
16:1	0.2604	6.6146	32.552083	0.826824570315
64:1			8.13802083	0.206706142579
256:1			2.0345052083	0.051676535644
1024:1			0.508626302083	0.0129191339112

Linear Motion: 13mm Motors w/16 position encoders

Gearhead Ratio	Max Travel Rate ²		Resolution ¹	
	Inch per second	mm per second	µinch per count	µm per count
14:1			28.3145340244	0.719190602601
43:1			9.10110022182	0.231168407971
66:1			5.89885125495	0.149831375538
134:1			2.92535364274	0.0743041311339
159:1			2.45029621358	0.0622376483002
246:1			1.58815495325	0.040339216491
415:1			0.940292242313	0.0238834707217
592:1			0.659695134427	0.016756289927
989:1	0.2604	6.6146	0.395013030464	0.0100333510405
1526:1	0.2604	6.6146	0.25602696419	0.00650309789662
2608:1			0.14876754182	0.00377870311963
4365:1			0.0890792041086	0.00226261630959
5647:1			0.689303365126	0.00175083404909

Encoder resolution calculations:

Encoder counts per shaft revolution	= 48 encoder counts x Gearhead ratio
Minimum encoder count (inch)	= Lead (0.0125 inch)/ Encoder counts per output shaft revolution
Minimum encoder count (millimeter)	= Minimum encoder count (inch)/39.37 x 10 ⁻³ inch
Minimum encoder count (micrometer)	= Minimum encoder count (inch)/39.37 x 10 ⁻⁶ micrometer (µm)= 39.37 x 10 ⁻⁶ inch
1 deg (deg)	= 3,600 arc-second
1 arc-sec	= 0.277 x 10 ⁻³ degree

Notes:

- 1) The lead values shown above in both travel rate and resolution calculations, are for 80 (1/80) Threads per Inch (TPI) leadscrews. For a 40 TPI leadscrew, substitute 0.025 inch lead.
- 2) Max travel rate calculated with motor armature running at a maximum speed of 20,000 RPM.